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TRANSACTIONS  
OF THE  
HIGHLAND AND AGRICULTURAL  
SOCIETY OF SCOTLAND

WITH  
AN ABSTRACT OF THE PROCEEDINGS, THE PREMIUMS OFFERED  
BY THE SOCIETY IN 1875, AND LIST OF MEMBERS.

PUBLISHED ANNUALLY.



FOURTH SERIES.

VOL VII

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SECRETARY TO THE SOCIETY.

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1875.

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TRANSACTIONS  
OF  
THE HIGHLAND AND AGRICULTURAL  
SOCIETY OF SCOTLAND.

---

ON THE AGRICULTURE OF THE STEWARTRY OF KIRKCUDBRIGHT AND WIGTOWNSHIRE.

By THOMAS MACLELLAND, North Balfarn, Kirkinner, Wigtownshire.

*[Premium—Thirty Sovereigns.]*

It is proposed in the following report to give,—

1. A General and Statistical Account of the two Counties.
2. The Nature and Condition of the different Soils.
3. Some details of the Peculiarities of the Climate.
4. Some of the Reclamations and Improvements effected during the last twenty-five years.
5. A Sketch of the Early State of Agriculture in Kirkcudbright and Wigtown.
6. Some of the Causes which led to its Advancement.
7. A Sketch of the present System of Farming.
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14. The System of Sheep Breeding.
15. The System of Sheep Feeding.

16. A Description of the Moorland and the Management of the Mountain Sheep.

17. A Sketch of the Dairy System and Details of Dairy Management.

18. The Management of the Permanent Pasture and Meadow Land.

19. A Sketch of the Present and Past Condition of the Farm Labourers and the Cottage Accommodation.

20. Remarks on the Farm Buildings.

21. Conclusion.

### *1. General and Statistical Account.*

Kirkcudbright and Wigtown occupy the most southern part of Scotland, and, conjointly, have long been known under the provincial name of Galloway. They are bounded on the south by the Solway Frith and the Irish Sea; on the west by the North Channel, which separates Scotland from Ireland; and on the north by Ayrshire; they are divided from Dumfriesshire, on the east, by high mountainous ranges, and by the river Nith, which falls into the Solway.

They are separated by the river Cree and Wigtown Bay. Wigtownshire anciently was called West Galloway, and the Stewartry East Galloway. The peninsula formed by Loch Ryan and Luce Bay, in the western district of Wigtownshire, is called the Rhinns, and the south-east district is called the Machars. The most important rivers are the Dee, the Cree, the Fleet, and the Urr in Kirkcudbright, and the Bladnoch and water of Luce in Wigtown. On these rivers are situated important and convenient ports for shipping produce, or importing manures and feeding stuffs, so that the greater part of the province is well placed as regards water carriage.

There are twenty-eight parishes in Kirkcudbright, the valuation of which was in 1872-73, £322,752, exclusive of railways or royal burghs. In 1846 the valuation was £193,751. In Wigtownshire there are sixteen parishes, the valuation of which was in 1872-73, £206,338; thirty years ago it was £131,277.

There are 610,313 statute acres in Kirkcudbright, and 327,906 in Wigtown, making a total of 938,219 in the two counties. A great part of these is entirely pastoral or mountain land. There are in Kirkcudbright 439,468 acres of heath or mountain land, and in Wigtown 186,572 acres, making in both counties 626,040 acres, or nearly two-thirds of the whole taken together.

There are in Kirkcudbright 417 distinct landed properties, several of which are held by the same owner. One proprietor has a rental of over £18,000; three proprietors have a rental of

from L12,000 to L15,000; three from L5000 to L7000; thirty-three from L1500 to L5000; seventy-two from L500 to L1500; fifty-five from L300 to L500; one hundred and seventeen from L100 to L300; and seventy under L100. In Wigtown there are seventy-two landed proprietors, one of whom has over L39,000 of rental; one has L24,400; one L15,000; one L11,300; eight from L5000 to L9000; nine from L1000 to L3000; and seven from L500 to L800.

Kirkcudbright is in form that of a well-defined parallelogram, and lies compactly together, without any very marked irregularity in its boundary lines; its greatest length is from north-east to south-west. Wigtown is deeply indented by Loch Ryan on the north, and Luce Bay on the south, which, meeting within a few miles of each other in the western portion of the county, give that part of the shire a very irregular appearance; while Wigtown Bay, reaching far up on the other side, forms a deep indentation on its eastern edge.

The north-west portion of the Stewartry is very wild and mountainous, and some of the hills rise to a considerable elevation; the highest being Merrick, which is 2764 feet above sea-level, and is the most elevated ground in the south of Scotland. In this part of the county there are numerous lochs, several being found in every parish; and many spots of wild and romantic beauty occur, which might compete with Highland scenery were they more accessible by rail, and better known to the tourist. The south-west, or arable portion of the county, is comparatively flat, and contains no very high land, but consists chiefly of gentle undulations, which afford a declivity for draining the superfluous moisture from the soil.

The general appearance of Wigtownshire, when viewed from a distance, is flat and uninteresting. There are, however, many spots remarkable for their quiet beauty, which can only be seen to advantage by an actual visit; the sea view entering largely into the composition of the landscape. The lower or arable part of the county is characterised chiefly by a succession of low rounded hills, none of them rising to a greater height than 300 feet above the sea-level. These, with the valleys between, being all under cultivation, which is every year reaching greater perfection, are seen to better advantage on close inspection; and although there is little in the landscape to attract attention from a distance, the close observer will meet with objects of instruction and interest in an agricultural point of view in this county which occupies a comparatively isolated position on the map of Scotland. The mountain or pasture division of the county does not possess any very remarkable features. Occupying the northern part, it gradually increases in elevation from where the



arable land terminates until it reaches the boundary of Ayrshire. The highest land in the county is at its northern extremity, where various ranges are found from 800 to 1000 feet above the sea. Large tracts of flat moorland occur between the elevations, and in every parish there are extensive mosses, which furnish the scanty population of the upland district with a plentiful supply of fuel.

## 2. *Soils.*

The arable soils may be classed under four different heads—first, those resting on a rocky subsoil; second, those resting on a till subsoil; third, the alluvial soils; and fourth, the gravelly soils.

The first mentioned of these, the rock soils, are not so widely extended as the till soils, but are generally more fertile. Where these occur the surface is broken up by the tops of the rocks into large knolls, which in many parts of Galloway are the predominant feature in the landscape. So much is this the case, that on some fields not more than one-half of the surface can be cultivated; but the soil between these knolls, as if to make up for the deficiency, is exceedingly fertile, and produces large crops of wheat, barley, and oats in the best districts. Notable examples of the rock soils are to be met with in the Machars, or lower district of Wigtownshire, in the parishes of Sorby, Glaserton, and Whithorn, where they are much interspersed with the till soils, and, in the southern part of the Stewartry, in the parishes of Anworth, Borgue, Rerrick, and Kirkcudbright. These soils are in general naturally dry, but occasionally may be found wet; and when this is the case great difficulty is experienced in draining them, owing to the rock being so near the surface. The rock soils are generally difficult to cultivate, from the number of small peaks protruding, or boulders lying immediately beneath the surface. The operations of modern implements are greatly impeded by these obstacles; and, before any satisfactory progress can be made with them, these stones have all to be removed. This process on some farms is no easy task; but, from the heaps of quarried rocks we see accumulating in vacant corners, it is pleasing to draw the inference that the soil is gradually getting rid of these obstructions.

The till hills are likewise a characteristic feature in the Galloway landscape, and form about two-thirds of the whole arable land. They rise with a gentle slope in some places, though in others the ascent is steep to the height of from 100 to 200 feet, and always terminate in a rounded or oval top. These soils, from the hard and retentive nature of the subsoil, are naturally wet and springy, and require close and careful draining. When

dry they produce fair crops of oats and sometimes wheat, but are not suited for barley. It is worthy of remark, that the south side of the till hills is always the best soil. The till lands contain a great many glacial boulders of granite and blue stone, and not unfrequently some large specimens of a beautiful conglomerate are found. The latter are extremely hard, and defy the hardest steel to bore them, so that it is sometimes difficult to get them taken out of the soil. These boulders have evidently been transported from a great distance, as no rocks of a similar character are to be met with in Wigtownshire; and though Kirkcudbright has many granite quarries, none of the conglomerate has been discovered there. In the Rhinns, or upper district of Wigtownshire, there is a good deal of black top or moor top resting on a till bottom. This land at no very distant period was covered with heather and a small kind of furze, but is now in a fair way of being all improved. Though capable of much improvement, this black-topped land will not produce crops of equal quality with the thinner rocky soils.

The alluvial or clay soils form a small proportion of the whole arable land in the two counties. They are found on the west side of Wigtown Bay, and on both sides of the river Cree as far as Newton-Stewart; small patches also occur on the banks of the rivers Fleet, Dee, and Urr. An important tract of the same kind of soil lies on the sea-shore in the parishes of Colvend, Kirkbean, and Newabbey, reaching with a narrow stripe as far as Dumfries. These soils are composed for the most part of a strong deep clay, generally more fertile and friable nearest the sea-shore, and increasing in tenacity on approaching the hard land. They are capable of bearing wheat, barley, oats, and beans; but owing to the heavy rainfall, green crop cannot be grown upon them with profit, except in some dry seasons, in which these soils are always most productive.

The gravel soils occupy a small proportion of the arable land. They are generally not far from the sea-coast, where they formed the ancient high-water mark. They are easy of cultivation, but from their open porous nature, manure is not retained for any length of time.

### 3. *Climate.*

In describing the climate of two such counties as Kirkcudbright and Wigtown, where the difference of altitude of the land is so great, it will be necessary for the sake of perspicuity to divide them into two districts, and treat of the climate of each separately; as, indeed, they are possessed of almost distinctly different climates. These may be denominated the low-lying or

sea-bound district of both counties, and the inland and mountain district. The climate of the former, or low-lying district, is very much influenced by its being in a great measure surrounded by the sea. Wigtown, though a small county of only 512 square miles, has 140 miles of sea-board, or more than one mile of sea shore for every four square miles of land. The tides, which visit these shores twice a day, come through the North Channel, and are in immediate connection with the north-west branch of the Gulf-stream. The effect of this upon the climate of the western part of Wigtownshire particularly, is very marked. Along the coast, by Burrow Head and Mull of Galloway, which are the most southern points of Scotland, it is calculated that the tide in spring flows at the rate of six miles an hour; and such is the influence of these currents, that, while the soil four or five miles inland is bound with frost, the plough is rarely stopped in the vicinity of the sea-coast. The same remarks apply to the land stretching from the Mull of Galloway to Corsewell Point, where severe frosts are almost unknown. Farmers in these districts do not require to have a great store of turnips in winter, as they are seldom prevented by frost from lifting them, even when it is severe in the inland districts. Snow, when it falls, which is not often, seldom remains more than two or three days, and in some severe winters, when the high lands in the Stewartry and part of Wigtownshire, as well as most of Scotland, are covered, all the lowlying lands in the latter county are entirely clear of it.

Though the climate of the lands along the sea-coast is so mild, it is at the same time very moist. A table of the rainfall is subjoined, from which it will be seen that, on the average of the past eight years, the rainfall is greater, and the number of wet days very considerably more, than in the east of Scotland. The prevailing winds are from the south and south-west, which show their effect along the whole line of the western coast, the tops of the trees and bushes growing near the sea being cut away, as with the pruning-knife, by the salt spray. The south and south-west winds are exceedingly mild in winter, and frequently in moist weather the fields assume the green hues of summer. When these winds prevail about the beginning of November, the anomaly is presented of the night temperature, at that time, being similar to that of the 1st of June. During the course of many years' observation the writer has noticed this to be of frequent occurrence. Heavy dews are another characteristic of the climate, which, though of immense advantage to young plants in dry weather, prove very troublesome in harvest, at which time, particularly when the weather is dry and calm, the moisture is so heavy as to weigh down the heads of the grain.

These heavy dews frequently cause harvest operations to be suspended for some hours in the morning—a singular contrast to the climate of East Lothian, where dew is of rare occurrence at that season.

The inland and mountain division, which includes the high and northern part of Wigtown and the greater part of Kirkcudbright, with the exception of the land along the sea-board, has a climate a good deal more rigorous than that of the lower district. Snow generally begins to appear on the high lands in Minnigaff in November, which, however, does not often remain over winter. The same hills get a fresh covering now and then during winter, and occasionally they are “stormed” for six weeks or two months. Frost, when it does occur, is very severe among the hills, one or two nights of it being sufficient to freeze the lochs for curling.

Lower down in the arable districts, free from sea influences in the inland parishes, frost occasionally occurs with severity, and turnips require to be early secured in pits, or otherwise covered with earth, to withstand it. The two counties are comparatively sheltered by the high lands in the midland counties of Scotland, from the easterly and north-easterly gales, the force of which is partially expended before reaching them.

A great drawback to the success of agriculture is the broken weather which prevails during the harvest months; indeed, it not unfrequently happens that August and September are the wettest months in the year. The following table shows the rainfall in these two months for the last eight years, with the number of days on which rain fell, which, compared with the table of the rainfall during the same months in East Lothian, will show the disadvantage at which the south-western counties are placed in that respect.

Table of Rainfall in August and September for eight years, ascertained at North Balfern, Wigtownshire.			Table of Rainfall in August and September for seven years, in East Lothian.	
Year.	Rainfall in inches.	No. of days on which rain fell.	Year.	Rainfall in inches.
1865	5.53	31	...	...
1866	10.68	53	1866	6.20
1867	6.34	36	1867	3.15
1868	8.46	34	1868	7.10
1869	7.42	29	1869	5.90
1870	5.63	32	1870	2.95
1871	5.51	25	1871	5.00
1872	11.30	40	1872	8.60
Average,	7.60	35	Average,	5.55

Table of Rainfall in Wigtownshire for eight years, ascertained at North Baifern, Wigtown, 100 feet above sea-level.					Table of Rainfall in East Lothian for seven years, ascertained at Fenton Barns, by G. Hope, Esq., 1870 100 feet above sea-level.	
Year.	Rainfall in inches.	Greatest fall in twenty- four hours.	Date.	No. of days on which rain fell.	Year.	Rainfall in inches.
1865	39·75	1·07	Oct. 17	198	...	...
1866	47·87	1·51	Nov. 15	231	1866	26·25
1867	36·90	1·07	Apr. 26	208	1867	22·96
1868	50·39	1·24	Feb. 18	199	1868	22·57
1869	40·36	1·54	Nov. 13	190	1869	20·60
1870	34·85	1·17	Sept. 1	153	1870	17·00
1871	45·07	1·75	Feb. 11	183	1871	27·19
1872	62·14	2·10	July 7	238	1872	44·00
Average,	44·66	...	...	200	Average,	25·78

#### 4. Reclamations.

As already noticed, a considerable portion of the soil of the two counties consists of the rounded till hills, or the sloping fields of the rock soils. Many of the hollows between these eminences were, five and twenty years ago, mere marshes lying in a state of nature, undrained, and quite unproductive. They were composed chiefly of mossy loam, resting on a bed of clay and shingle, while upon the surface grew the bog myrtle, provincially termed gall, the marsh mallow plant, wild geranium, shaking grass, and other plants indicative of wet uncultivated land. Hundreds of acres of these marshes were drained and reclaimed by the private enterprise of the tenants, who, by doing so, converted many a swamp into good arable land. Extensive tracts of these unproductive hollows were also drained by Government drainage-money, a large share of which was expended in the two counties. The soil of these hollows, after being reclaimed and cultivated, proved very productive, and required little manure to produce heavy crops of oats—their mossy tendency rendering them unsuitable for the growth of the wheat plant.

We shall now, under this branch of the subject, proceed to give an account of the more extensive reclamations which have been effected.

At the head of Wigtown Bay, and to the north of the river Bladnoch, where it falls into the sea, there is a large tract of ~~slightly~~ sandy sands, marked on the Ordnance maps "Wigtown Sands." The proprietor of the adjoining land, the late Randolph Earl of Galloway, obtained an Act of Parliament in 1839 for the reclamation of a large portion of these sands, shortly after which date operations for this purpose were commenced. A substantial stone embankment was first built along the north side of the channel

of the river Bladnoch, extending seaward to a distance of about 1500 yards. This was to act as a barrier in that direction against the sea, which, with a south or a south-east wind, rolled over the sand to be reclaimed with a considerable surf, preventing the deposition of the silt, which, it was intended, should be retained for the elevation of the enclosed sand. A line of thorns, securely tied up in small bundles, was next run from the sea end of the embankment towards the nearest point of the land, distant about 1600 yards. At first occasional breaks or openings were left in this line, which were covered by an inner row of thorns placed at a distance of 20 yards from the openings; but it was found that the ebb tide formed gullies or "runners" in the sand through these openings, thus carrying off the deposit of silt, and otherwise injuring the outside row. This plan was abandoned for the continuous row, which was found to answer the end much better, though these gullies are still apt to appear where the bank of thorns becomes injured by the surf. At present the sand in the inner side of the thorns is from 3 to  $3\frac{1}{2}$  feet higher than the level of the uninclosed sand, so that considerable progress has been made with the reclamation. About 500 acres have been thus enclosed, the most of which is now green, and is covered with the sea pink (*Cerastium repens*) and other marine plants. Spring tides still flow over all the enclosed sand, adding every year their deposit of silt, which, with a south-east gale and a high tide, has been known to accumulate to a depth of 6 inches in a single tide in sheltered places. Substantial embankments also enclose a considerable tract of alluvial land on the right bank of the Cree, over which the tide formerly flowed, but which is now under regular cultivation. The sum expended since the commencement of these operations does not fall far short of L.40,000.

Auchrocher Moss is situated in the parish of Inch, Wigtownshire; it contains about 90 acres, and is the property of the Earl of Stair. Before being drained it was a worthless swamp, filling the surrounding air with unhealthy fogs, now it is a cultivated field let to an enterprising tenant at a rent of 30s. an acre. The project of draining this swamp was first started in 1847, and under the able and energetic direction of the late G. Guthrie, Esq., Rephad, factor on the estate, the operation was pushed forward as rapidly as circumstances would admit. Though more than two miles from the sea, the levelling instruments showed that the moss was very little above high-water mark. As in that case no fall could be lost, it was decided that a culvert should be driven up from the sea almost on a dead level. This culvert, which was built entirely of bricks, was of an oval form, 4 feet high and about 2 feet wide. As the work progressed, the builders came upon a subsoil of running sand, which rendered

the construction of the culvert a very difficult operation. Many parts of it had to be built on boards upon which men had to throw their weight, to prevent the fine sand from boiling up until the masons got their bricks laid on this foundation. After encountering many difficulties, and at an expense of L.1000, the moss was reached. And here it was found that in some places it was of great depth and very soft, and required to be bridged over with beech boards, upon which the draining tiles were placed. This moss has been carrying crops of oats and potatoes alternately ever since, but has this year (1873) been put under the same rotation as the rest of the farm, owing to the dearth of labour.

The next piece of reclamation on a large scale to be noticed is the drainage of the Loch of Dowalton. This was a sheet of water occupying the lower end of a valley of extensive mosses, and lying between the parishes of Sorby, Kirkinner, and Glaserton. It was about a mile and a quarter in extreme length, and nearly three-quarters of a mile in extreme breadth. The proprietors of the adjoining lands, whose estates were to be benefited by the draining of the loch, were Sir W. Maxwell of Monreith, Lord Stair, and R. Vans Agnew, Esq., M.P., of Barnbarroch. It was at first contemplated in 1849, by Sir W. Maxwell, to lower the waters of the loch 3 or 4 feet, but on comparing the different surveys, and after mature deliberation and consultation with J. McLean, Esq., the factor on the estate, it was decided to drain the loch altogether. To effect this, it was found by careful measurements that it would require a cut of 24 feet in depth, and this would be for a considerable distance through rock. The draining of the loch was commenced in 1862, and was effected wholly at the expense of Sir W. Maxwell. The loch covered about 212 acres, one-half of which was in Sir W. Maxwell's estate, the other half partly in Mr Vans Agnew's and partly in Lord Stair's. Besides the bed of the loch reclaimed, there would be about 400 acres of Sir W. Maxwell's adjacent lands which had been so little above high-water mark as to be incapable of being drained, so that there have been above 500 acres of workable land added to the Monreith estate. Beside the material value of the land reclaimed, the benefits arising from the improved climate were striking. In still damp weather, raw heavy fogs hung over the swampy bogs at the head of the loch before it was drained, diffusing their deleterious influences far over the adjacent lands; now that the stagnant marshes are dry, the surrounding air is purer and warmer, and consequently more healthy.

An interesting piece of reclamation was effected by the writer in 1857, on the farm of South Balfarn, which, though of limited extent, shows the advantages to be gained by the drying of waste

hollows. This was a bog of deep moss, with a top of light flow, called Cranberry Bog, containing about an acre and a half. It was surrounded on all sides by gravelly ridges, the lowest part of which was 14 feet above the surface of the bog. Having resolved on the course of the outlet, the first operation was to remove from along this the soil and gravel to a depth of 6 feet, which was carted on to the bog. Three hundred and fifty cubic yards of this were thus laid on the top of the moss, giving solidity to the light soil underneath. No burning was resorted to, as it was deemed of importance to keep the surface as high as possible. When the drains were opened, the bottoms in several places were found so soft and full of water that boards had to be used to support the tiles. A pole 12 feet long pushed down in these places could find no bottom. The success of this operation was complete, and in the following winter the bog was quite solid enough to bear the horses and plough. The expense of draining this waste, including the cutting of the outfall, with tiles and other charges, except carriages, was L.15, of which the succeeding crop, oats, repaid L.10. The bog is now under cultivation, along with the field of which it occupies the centre.

Many thousand acres of profitless moss occupy the hollows formed by the surrounding arable land. The tenants of the adjoining farms generally receive permission from the landlord to reclaim as much of the moss as they choose, on the understanding that no rent is to be charged for the reclaimed land during the currency of existing leases. Large portions round the edge of the mosses have in this manner been made productive by the tenants. In reclaiming moss, the general plan of operations is—first, to cut an outfall 6 or 7 feet deep, which is commonly left open. Leading into this, the small drains are cut, 4 feet deep and 24 feet apart. When the moss is very soft, the drains are cut 2 feet deep at first, and allowed to stand for a time. After being finished, and when dry, the moss will have sunk nearly 2 feet. Oats, sown with guano, is the first crop; the second crop is oats not top-dressed. Twenty bushels, or two tons of lime per acre, are generally applied, and also a covering of till or gravel; after that the moss will be in a proper state for the cultivation of the potato. An extensive moss in Galdenoch, on the Lochnaw estate, the property of Sir Andrew Agnew, was lately reclaimed under the able direction of D. Guthrie, Esq., the factor on the estate. The extent of it is over 100 acres, and the cost for draining was L.640. The tenant is to pay 10s. the acre for the reclaimed moss, besides interest on the outlaid capital.

Draining, which is the foundation of all improvement on the soil, was carried on vigorously as long as the Government money lasted, and between 1848 and 1853 great changes were made in



various localities. Numerous instances might be given of enterprise and energy in carrying out improvements at that time, but we shall only allude to the lands of Craiglemine and Appleby. This is a property in the parish of Glasserton, Wigtownshire, which, previous to being purchased by George Guthrie, Esq., Rephad, in 1847, was in a very wild and unproductive state. A great part of it was of heavy till, full of water, but capable of much improvement. Moss entered largely into the composition of the hollows, while a large moor in a state of nature occupied the heights of Appleby. The extent of this property was 677 Scots acres, upon which Mr Guthrie expended £4250. He found it a wilderness, and made it a garden. The rental of it when it came into his hands was £422, 13s. 4d.; it was let after being improved to the present tenant at £1150.

Many farmers, seeing the benefits arising from capital thus expended, were induced to prosecute further improvements at their own cost; while considerate landlords, desirous of encouraging this spirit, entered into an agreement to meet their tenants half-way in draining, the proprietor furnishing the tiles and the tenant making the drains. This excellent rule still holds good on some well-managed estates, and there can be no doubt but it affords great encouragement to an enterprising tenant, without causing the ill-feeling that is apt to spring up at the end of a lease, when the tenant may have to leave behind him all substantial improvements executed solely at his own cost.

### 5. *Early State of Agriculture.*

The earliest local record of the terms which regulated the setting of land, appears in the Rent Roll of Barnbarroch, in the possession of R. Vans Agnew, Esq., M.P., and is dated 1624. The following extract is a specimen of the agreement between landlord and tenant at that time, and is given entire and verbatim:—

“Drumgargon, set with the land vi bolls corn, and vi peckis beir—pays yeirlie xl merkis money, v bolls beir—i veder—iii lambis—xii putrie, ij geis, 1 cog buter.”

It will be seen from this that the tenant received on the land from the landlord when he took the farm, six bolls of corn and six pecks of bear, which he also had to leave when he gave it up. The yearly payment was forty merks, or £2, 4s. 5d., besides payment in kind or produce of five bolls bear, one wedder, three lambs, twelve poultry, two geese, one kit of butter. The scarcity of money throughout the country at that time would no doubt be the cause of part of the stock on the farm belonging to the landlord (from which undoubtedly arose the law of hypothec), and also of the rent being partly paid in kind. A good wether

sheep could be had for 3s. 2d. of our money, a good lamb fit for the butcher at one merk or 13d., and a goose at 6d. These were the valuations of the stock of the Baronies of Barnbarroch and Mochrum in 1624.

A century later, in 1729, we find the agreement on the same farm to be as follows:—

“Pays of silver rent yearly at the two terms 078,00 lbs., four geis, six kapons, twol chickens, half a stone of good butter, six good load of well wine peats—to plow the land—one horse to loading hay, corn, mucking two days if required, with caradges and horses as usual, and the half of the public burdens—the valuations being 30 lbs.”

The tenant is here in possession of all the stock on the farm, and is gradually assuming a more independent position. The payments in kind remain the same as in last century. Referring to chickens and hens, there seems to have been a peculiar institution in most leases of last century, and that was the payment to the landlord of what was called “reek hens.” At that period the architects of the farm-houses never seem to have made provision for the smoke or “reek” to escape. A hole was made in the roof, where it might find its way out, but without any chimney to conduct it upwards, it generally filled the whole house, and from sheer pressure forced itself out of door and windows. On the rafters of the house the poultry always lodged, and the best hen roosted most directly over the fire, hence the name “reek hen.” These hens were esteemed great delicacies, and were continued as payment in kind in some leases as late as 1800.

Towards the middle of the last century the system of the rotation of cropping is first noticed. The following is an extract from a tack of the farm of Barwhannie, in the parish of Kirkinner, taken from the Barnbarroch papers, and is the first that bears on the subject, it is dated 1753:—“Besides he is to be bound to break up no ground after the first 3 years of his lease that has not layn 8 years in grass, he is to cast out ye marl, take 4 crops running, then let it rest 6 years, then 3 crops, and then rest 6 years, and so on.”

The use of marl was first introduced as a manure in Galloway about 1730. It was not generally applied, however, until much later in the century, when tenants were bound in their leases to cart it on to the land. The effect of this calcareous clay when applied to the exhausted soil was surprising. Instead of the long emaciated grain of former years, the oats grew plump and well filled; but the former character of the grain soon became apparent when the application was stopped.

One of the peculiarities of these counties during the past century was the great number of small holdings of land. In

some districts the farms were nearly as large as they are at present, but in different localities small crofts were very numerous, and in consequence the counties were thickly inhabited. The country houses at that time, and indeed for long after, seem to have been of the most wretched description. They were commonly miserable dirty hovels, built with stones and mud, thatched with fern and turf, having low doors, and mere holes for windows without glass, but stuffed with turf, straw, or fragments of old clothes. Their cows lodged under the same roof with the tenants, and often without any intervening wall or partition. These wretched houses appear to have existed down to a late period. In a letter the writer has from the late Sir John M'Taggart of Ardwell, he refers to this, and says, "When I succeeded to my estate in 1810, the population must have been very great, as I took down a vast number of mere hovels." Indeed, a few specimens of the same kind of hovels may be seen at this time in the parish of Portpatrick.

The management on these small farms was of the most primitive description. A piece of land near the homestead was selected as being the most convenient, and this received all the manure made on the farm, which was carried out of the byre in baskets made the shape of the back; this was before the invention of wheelbarrows. This was called the "Bear Fey," from bear being so repeatedly sown on it. The rule of cropping has been alluded to in the extract of lease, and it may be remarked, that the first white crop was generally oats, then three or four successive crops of bear or bigg were taken. The bear was grown so extensively because the oats were thirled to particular mills, and the bear was not.

The implements of the time were of the rudest description. The roots of the all-prevailing whin formed the teeth of the harrows; these had to be taken home every evening to be sharpened and hardened in the fire. For the plough chains they took the skin of any of their horses that died, cut it into stripes, and tanned them; these were called "strekens." Their horses' collars were manufactured by plaiting straw, usually done in the evenings by some of themselves. Thus they had a very cheap harnessing for their horses or bullocks—six of the latter and two of the former being common in one plough in 1750.

The want of suitable markets at that time, in two counties so distant from the centres of population as Wigtown and Kirkcudbright, was a great drawback to the advance of agriculture; for we find in 1776, that cattle sold to the butcher at home were worth only 2d. to 2½d. per lb. The great bulk of the fat cattle had therefore to be sent to London on foot. They walked fifteen miles a-day, and took thirty days on the journey, and cost for driving and charges 18s. to L.1, 4s. "They paid the expenses

well, for what was offered for from L.10 to L.5 at home, sold there from L.15 to L.18."

The following extract from the Barnbarroch papers shows the profit on feeding stock at that time :—

"Account of Cows bought for feeding fat in spring 1750—32 Cows bought from 22 different persons		
cost . . . . .		L.40 17 2
5 { To be deducted 4 of ye winterings and 1 of ye sum- mers cows kept for my own use, . . . . .		6 1 10
		<hr/> L.34 15 4
27 Cows sold to D. M'Adam in Baldoon, 13 of them taken of the grass in Sept., the rest in Nov.—pay- able at Martinmas, . . . . .		L.54 13 0
		<hr/> L.19 17 8
Given luckp <sup>ny</sup> ,		0 10 6
		<hr/> L.19 7 2"

The feeding stock was usually bought in spring, the cows at that time being very lean, after the scanty winter fare obtainable for them.

From a list of prices of farm stock and crop in the possession of the writer, commencing with 1772, it appears that the price of good two-year old black cattle at that date was L.2, 2s. each, and the boll of oats and bear, consisting of 12 imperial bushels, was L.1 and L.1, 6s. respectively. These low prices for cattle continued with slight variations for ten years, when a gradual improvement began to show itself, and by the end of the century two-year old cattle were worth from L.8 to L.9. Later on, for three years ending 1813, the average price for that time was about L.13, 13s. The improvement in the price of grain was longer in commencing, and it was not until 1800 that a very decided change took place. Owing to the excessive dearth that occurred that year, oats suddenly rose to L.4 the boll, or 6s. 8d. the bushel, and bear for the same measure rose to L.5, or 8s. 4d. the bushel.

But between the middle and the end of the century, a long and dreary night of low prices had reigned, oats frequently falling as low as 16s. the boll, or 1s. 4d. the bushel, and only on one year (1785), reaching 2s. 6d. the bushel. The rent of land during that period was what we would consider now merely nominal. In 1765 the farm of Kirkland of Longcastle, and parish of Kirkinner, the property of Sir W. Maxwell of Monreith, was let to J. M'Adam for L.106, 13s. 4d. Scots money, equal to L.8, 17s. 8d. sterling. This was what was called the silver rent; there were also payable 5 bolls bear and meal, some chickens and peats,

besides ploughing as much land as would sow 5 pecks oats, and harvesting the same. The rent of this farm at present is L.281. The farm of Cairnfield, belonging to Sir W. Maxwell, was in 1781 rented by W. M'Adam at about L.15 sterling, the rent of which is at present L.202. These examples will serve to show the very low state of agriculture at the time, many landlords offering their farms for cultivation free of rent charge.

The wages of farm servants of the period were as follows:—Ploughmen in master's house for the summer half year, L.1, 10s. to L.2, 2s.; women's wages for the same time, L.1, 5s.; harvest wages, L.1, 3s. to L.1. 5s., "the men to provide their own hooks and hold themselves up." Low as rents and wages were, the farmers of Galloway had great difficulty in meeting their engagements with their landlords. Rents could not be got paid for months after they were due, and when paid, had often to be borrowed by the less fortunate tenant from the neighbour who was in a more thriving state.

At the conclusion of the first American war in 1783, taxes being increased to an alarming extent, a number of farmers in Wigtownshire, seeing a new country opened to them under a more liberal rule, and free from these objections, resolved to make an attempt to better their condition by emigrating to the land of the West. Accordingly, two vessels were chartered to proceed to America, and between eighty and ninety tenant farmers sailed from Isle of Whithorn to seek their fortunes in the land of freedom. Shortly after this farms were gradually enlarged, fences erected, and a gradual advance made in rural management, to which various causes contributed, and to which we would now advert.

#### 6. *Causes which tended to the Advancement of Agriculture.*

The first impetus the agriculture of the two counties received was consequent on the high prices of grain during the French war. Gold or silver had always hitherto been a scarce commodity in Galloway. No transaction of buying or selling was ever settled in cash. Bills or promissory notes were given and taken for the smallest, as well as for the largest amount. Tradesmen's accounts, and even servants' wages, were paid in the same manner. When the excitement of the French war brought prices double of what had ever been heard of, and gold found its way into the district, the farming interest began to flourish. New steadings with thrashing mills were erected, strong and substantial fences were put up, and improvements on all sides became visible. The rent of land received an extraordinary advance, and at the set of the Baldoon estate in 1806, just before purchased by the Earl of Galloway, such was the excitement,

and the eagerness to possess land, that the auctioneer had to restrain his bidders with the caution, "Remember, gentlemen, you are not purchasing the land, you are only leasing it." But, alas! the high built hopes that these prices would always remain were suddenly dashed to the ground; for on the cessation of the war in 1815, the low prices which followed drained the farmers' pockets of most, if not of all their capital, leaving them completely in the power of their landlords, who in some instances, at least, did not push their advantage to the utmost. A period of great depression in agriculture ensued, and for twenty years neither landlords nor tenants were possessed of ability or spirit to prosecute much improvement.

An important event occurred in 1835, which contributed in no small degree to the progress of agriculture in the district. This was the opening up of the English markets by the steamer "Countess of Galloway." The want of a suitable outlet for the produce of these distant counties has been noticed previously. How much more would this be felt before steam navigation was introduced, when large numbers of sheep and cattle were fed on turnips with no outlet for them, but by the long and exhausting journey by land, or the still more precarious voyage in a sailing vessel. The nearest and most accessible market to West Galloway at that time was Ayr or Dumfries. But the journey for a bullock which had been stall fed for six months was wearisome, and the waste on the animal was calculated at from L.1 to L.2. On the other hand, if Liverpool was attempted by sea, there was no other communication but the small sailing coasters, which might be weeks on the voyage. The late Mr Edward Speed of Liverpool was about the first to push and persevere in the trade of shipping cattle in sailing vessels to Liverpool. Frequently have these frail crafts left Garlieston or Isle of Whithorn with their living cargoes, to be driven back to the port they started from, or have been obliged to take shelter in some distant harbour, where the animals were disposed of often at great loss. The uncertainty of this mode of transit, and the increasing demand for a more sure conveyance, led the proprietors, pre-eminent among whom was the late Earl of Galloway, and the farmers of both counties, to the idea of building a new steamer expressly for the purpose of carrying live stock. Accordingly, a fine safe steamer, the "Countess of Galloway," was put on the station, thus placing the Liverpool market within twelve hours of the two counties. Cattle and sheep by this conveyance could be shipped on the Saturday, and by the Tuesday or Wednesday following the returns with the money were safe in the pockets of the shippers.

Previous to the introduction of steam communication with Liverpool, sheep feeding on turnips had been carried on only to a limited extent. The chief part of the green crop break was

planted with potatoes, which flourished around the shore, and produced great crops when manured with the sea-weed found so plentifully on many parts of the coast. The few turnips that were produced were used for the wintering of black cattle, the natives of the district, either in large open courts on the arable farms, or were given to supplement the fodder on the hill side in sheltered places in the higher districts. Sheep feeding on turnips was commenced about the beginning of the present century, on the farm of Stewarton, by a Mr Heron, after which the system gained ground slowly until about 1817, when Highland wedders were introduced. The supply of wedders for turnip feeding had hitherto been obtained from the hill farms in Minnigaff. These were purchased in autumn, and, when brought down to their feeding grounds, had to be at once enclosed on turnips by hurdles or nets; but, from the number of deaths among them, the profits were never very great. Mr R. M'Clelland, North Balfarn, and Mr J. Greenshields, Stewarton, were among the first to introduce wedders to Wigtownshire from Falkirk. They being of a hardier constitution than the native breeds generally, left good returns. With the command of the English markets, sheep and cattle feeding increased to a great extent. New feeding byres were speedily erected, or the long empty sheds previously used for wintering cattle were fitted up with stalls. Large droves of Highland wedders were brought into the counties to consume the turnips, the cultivation of which had by this time greatly increased. After the failure of the potato crop in 1846, the cultivation of the turnip was farther increased, and guano and bone manure coming into general use, the number of cattle and sheep annually fattened became rapidly larger. In 1847 a new and larger steamer, the present "Countess of Galloway," was built, and superseded the old steamer, it being found too small for the requirements of the trade. The new steamer had accommodation for 200 cattle, besides several hundred sheep, and was capable of running three times a week to Liverpool and back; and previous to the opening of the Portpatrick Railway, in the spring months, its capabilities were fully taxed.

Another important event occurred in 1846, which contributed in no small degree to the advance of agriculture. This was the introduction of the turnip-cutter for sheep feeding. About 1833 lambs from Moffat and Lockerbie began to be introduced for feeding on turnips. These were generally kept on grass as late in the season as December, and were always fed along with old wedders, which broke the roots for the lambs, and induced them to begin eating sooner. When the lambs cast their teeth early in the spring, they made very little progress toward maturity on nothing but the hard Swedes, from which they could scarcely scrape as much as would keep them alive. The turnip-cutter

was therefore a great improvement; and though a good deal of prejudice existed for a long time against the "trough system" of feeding, by degrees the advantages of it became so apparent that, in a few years, these machines began to be generally used, and now there is scarcely a farm where several are not in daily use during winter. Young sheep by this means are kept in good growing condition all winter, and when the spring arrives, where they have been liberally treated, can be sold off the turnips fit for the butcher.

The introduction of ground bones and guano as manures exercised an influence most marked on the progress of agriculture. Before that the only manure available for green crop was farm-yard manure, which being made without the consumption of feeding stuffs or turnips, was not very rich in fertilising properties. Sometimes large quantities of the ashes of the quicken grass, which had been lifted off the fallow-land, very frequently in a foul state, were applied in the turnip drills, and raised excellent crops as far as they went. Ground bones had been in use, partially at least, in Wigtownshire since 1832. In that year Mr Thomas Routledge opened a bone-crushing mill at the village of Eldrig, Mochrum, and from that date the "Old Mill of Mochrum" has been quite an institution in the county. The present Sir W. Maxwell took a lively interest in the undertaking, and was the first to put a bone between the rollers. Guano was introduced about 1842, and was generally in use four or five years afterward. It is curious to compare the quantities applied per acre five and twenty years ago with what is required now. In a note-book of manuring belonging to the writer, dated 1848, 2 cwt. of Peruvian guano, with 10 bushels of half-inch bones, and 16 carts of farm-yard manure, was considered an extra application for Swedes, while the general quantities for the same crop were 2 cwt. guano and 20 bushels bones, without the farm-yard manure. The price of the guano that year was 9s. 6s. the cwt, and the bones 2s. 3½d. the bushel, making the total value of the two manures £2, 4s. 10d. the acre; not one-half of the cost of the manurial application of the present day.

Saldanah Bay and Ichaboe guano were largely imported from Liverpool, and used with great success shortly, after 1848. At that time these guanos were rejected as almost worthless by the Lothian farmers, who for many years afterwards would apply no manure to their green crop but the best ammoniacal Peruvian guano. It was demonstrated by experiment, as well as by the practice in Wigtownshire about that date, that equal parts of phosphatic guanos and Peruvian guano mixed would produce as good results in raising green crops as the same quantity of Peruvian guano alone, thus anticipating by some years the theory promulgated subsequently by the Society's and other chemists,



and which is now accepted as correct, that the larger percentage of ammonia found in Peruvian guano is not requisite for the growth of green crop.

### 7. *Farms and Farming System.*

As formerly noticed, the crofting system was at one time very general in these counties, but more particularly in Wigtown. These crofts have been thrown very much together, forming farms of moderate size, the particular fields of which still bear in many places the original name of the ancient divisions. There are still a few of these small holdings, some of which are not of sufficient extent to give constant employment to a man and a pair of horses. In that case, where crofts are contiguous, the crofters borrow and lend, so as to work their land at the least possible expense. The greater part of the arable land consists of farms of moderate size, from 100 to 600 acres, few exceeding the latter figure. In the Stewartry, where the proprietors are very numerous, the owners of the small estates farm their own land; there being between 200 and 300 landowners whose rentals vary from L.500 to L.100, and 70 under L.100. Several of the smaller class of arable farms are held by one tenant, some of the smaller proprietors also holding farms on which they do not reside.

Leases are much more commonly the rule in Wigtownshire than in Kirkcudbright. In the latter county, on the Selkirk estate, the farms are not generally let on lease except at the special desire of the tenants, when a valuation is put on them, often accompanied by a rise of rent. When no lease is sought, the rents are seldom advanced; some of the Earl of Selkirk's farms being occupied by tenants whose forefathers had been on the land for 200 years. In Wigtownshire the most of the farms are let on leases of nineteen years, it being considered undesirable to shorten or extend the time.

A considerable difference exists as to the time and conditions of entry. On the Galloway estate the entries are nearly all at Martinmas, the outgoing tenant being bound by the conditions of lease to *sell* at a valuation all his white and green crops to the landlord, who hands them over to the incoming tenant at the same price. The white crop is valued by two arbitrators, mutually chosen, who take proof in harvest; that is, every twentieth stook is selected, stacked, and thrashed separately, the rest of the crop being computed by the produce of the proof. The thrashing of the proof takes place at Candlemas, when the one-half of the produce is valued and paid, the other half is payable at Whitsunday. The incoming tenant is bound to pay the sum expended on seeds, provided they have not been depastured after harvest, in which case the outgoing tenant forfeits the amount; but in most cases this is matter of arrangement between the out-

going and incoming tenant. Whatever ploughing is done on the stubbles before Martinmas by the outgoing tenant has also to be paid for. On the Selkirk estate the entries are mostly at Whitsunday, the outgoing tenant having the white crop, which is taken at a valuation on the foot at harvest by two arbitrators mutually chosen. Where it can be arranged, the incoming tenant gets his horses stabled on the premises to plough the turnip break, but the stubble furrow has to be paid for. This entry is preferred by many as requiring less capital at starting, but the valuation of the growing corn at harvest is frequently very wide of the mark. The time of entry to nearly all the hill farms is at Whitsunday as being the most convenient for all parties.

The rotation under which the arable land has, until lately, been cultivated, is the five-course shift, but a growing inclination is being shown to extend this to the six-course. The order of the crops is:—Oats or barley on the lea; green crop—turnips, potatoes, or mangold; wheat, barley, or oats; seeds or hay; grass.

The six-course shift has recently been adopted on a number of farms, and consists of allowing the land to remain two years in grass instead of one, the crops in the rotation given above remaining the same. By extending the time between the repetition of the green crop, the disease of finger-and-toe is less liable to be produced, and heavier crops of turnips grown, also the quantity and quality of the grain is said to be improved under the lengthened rotation. Twenty-five years ago it was customary in some localities to take two white crops in succession after the lea, but this practice is now almost discontinued. The rotation on the clay or alluvial soils differs from that on the hard land, and is as follows:—Beans on the lea manured; oats; summer fallow; wheat with seeds; seeds; grass.

The land in the two counties is nearly all forerented, that is, the first half-year's rent is collected six months after entry. An exception to this rule is found on the Baldoon estate, the property of the Earl of Galloway, where the first half-year's rent is not due until nine months after entry. Twenty-five years ago the rents of several of the farms on different estates were regulated by the fiars price of grain, but at present there are few that are governed by this fluctuating, and at best unsatisfactory, method. Unsatisfactory it is to the farmer, as the custom has now been introduced among dealers of purchasing grain by so many pounds weight,—say wheat at 65 lbs., oats at 45 lbs.; and barley at 56 lbs. These quantities are given in evidence as imperial bushels, thus raising unduly the fiars prices.

#### *8. Cultivation and Produce of the Corn Crops.*

According to the Government returns in 1871, the total acreage under all kinds of corn crops in Kirkcudbright was 35,338,

which was apportioned as follows ;—Wheat, 993 acres ; barley or bear, 620 acres ; oats, 33,443 acres ; rye, 34 acres ; beans, 243 acres ; peas, 3 acres. In Wigtown there were at the same time under all kinds of corn crops, 39,800 acres, which were made up of the following :—Wheat, 4364 acres ; barley, 1568 acres ; oats, 33,307 acres ; rye, 150 acres ; beans, 402 acres ; 9 acres in peas.

Wigtownshire from an early date has been a wheat-producing county. Jeffery, in his communication to the commissioners of the annexed estates in 1777, says—"Till very lately every bushel of wheat used in the town of Dumfries was imported from a distance," of which a considerable quantity was sent from Wigtownshire. No doubt the open winter climate of this county partly accounts for the increased acreage under wheat compared with Kirkcudbright. The freedom from frost of the western portion of Wigtownshire affords frequent opportunities of wheat sowing on the turnip land as soon as it is cleared in winter. Wheat after turnips succeeds best when sown in early winter, say in November ; and every exertion is put forth to get the land cleared and sown up immediately. In the best farmed districts the land receives, before being ploughed, a top dressing of farm-yard manure, from 20 to 30 loads the acre, and no plant is more grateful for an application of this kind than the wheat. The succeeding grass crop is much benefited also. Except in settled weather, every day's ploughing is sown and harrowed before night, that is, on what is termed the "green furrow," as it is found, if the newly ploughed surface gets wet, harrowing is never so satisfactorily performed at that season. During the month of December it is deemed advisable to suspend wheat sowing, except under very tempting circumstances, until the middle or end of January, when every favourable opportunity is taken advantage of for proceeding with the seeding, which is frequently continued as late as the middle of March. The quantity sown per Scots acre, during winter and spring, is never less than 4 bushels or more than 5 bushels. The autumn-sown wheat is cultivated on the alluvial soils after a bare summer fallow. It is sown in September, or as soon as the teams can be spared after harvest, when the fallow receives a single furrow to ridge it up in the way in which it is to remain all winter. The quantity sown per Scots acre varies from  $2\frac{1}{2}$  to  $3\frac{1}{2}$  bushels, according to the taste of the sower.

The varieties in cultivation are numerous, but we will only mention the most important, with their chief characteristics. Red chaff grows stiff in the straw, is a hardy wheat for a damp climate, and well suited for strong land, not being easily lodged, grain slightly dark in colour, and in the English markets sells from 6d. to 8d. the bushel less than the whiter kinds. This.

variety is grown exclusively by Mr Sproat on the clay soils of Baldoon. Chiddam and red straw are fine wheats, but liable to rust in wet summers, especially the latter. Waterloo or woolly-eared wheat, fine sample, but easily damaged in stock with broken weather. Essex white is a general favourite, but apt to get lodged on heavy land. Talavera, a large open pickle, and the best spring wheat we have. April or awny wheat is not so much cultivated as it used to be.

It would be impossible to arrive at a satisfactory estimate of the average produce of the wheat crop in the two counties; the seasons are so variable that the produce occasionally falls very low, and in a good wheat year it is proportionately increased. The extremes may be given at 17 to 50 bushels the Scots acre, though it may be a question whether the mean of these figures would represent the average. The quality of the wheat ranges from 57 lbs. to 63 lbs. the bushel; but in moist winters it is usually deficient in condition until the spring. It is found of great importance in preventing the degeneracy of the produce to change the seed frequently. Wheat grown in England is best suited for this purpose.

The number of acres under oats in each of the counties is nearly the same, there being in Kirkcudbright 33,445 acres, and in Wigtown 33,307 acres; making a total of 66,752 acres.

Oats are sown on the lea break, or after the green crop. Those grown on the former are much finer in quality than what are grown after turnips or potatoes. The ploughing of the lea preparatory for this crop begins about Martinmas, and should be finished in time to allow the furrows to become consolidated before receiving the seed. Sowing commences from the middle of March to the end of the month, as the weather permits. There used to be a custom in Galloway, and one that was very strictly observed, that the sowing must be commenced on a certain day—the 12th of March old style—whether wet or dry. On that day one bag, at least, had to be sown, whatever the weather was, or the crop would never come to any good. Early sowing was more popular twenty-five years ago than now, many fields being finished by the 1st of March in the early districts; but latterly few farmers think of beginning until the middle of the month.

Oats sown early produce grain of a better quality, but less in quantity, than those sown late; it is also an advantage to have a field or two early ripe in harvest, so that the grain may not be all ready for the machine at one time. The quantity sown varies from 5 bushels to 7 bushels the Scots acre. Thick sowing, it is argued by many, improves the fodder, an important consideration certainly, but one which should scarcely be entertained at the expense of the grain produce. A great many

different varieties are sown, of which the following are the most important:—Potato oats are grown extensively, but chiefly on the better class of soils; on thin, poor land the straw does not bulk much. The quality of this variety is from 38 to 44 lbs. the bushel. Sandy, generally preferred for high districts, not being liable to shed the grain in stormy weather; the straw is bad fodder, but the grain meals well. It is a stiff-strawed grain, and used on heavy, loamy land. The quality runs from 40 to 43 lbs. the bushel. Canadian is a variety recently introduced; but is getting into disuse from the small produce. The grain is of superior quality, some parcels weighing 46 lbs. the bushel. The straw is not good fodder. The Early Angus, Birley, and others have each their own advocates; these varieties are sown chiefly on the secondary description of soils in the inland districts. Top-dressing with artificial manures is not much practised except on soils subject to the attacks of the grub, when 2 cwt. of some strong ammoniacal guano or manure is applied. It is the custom on some farms to top-dress the lea break with farm-yard manure in autumn before ploughing. It may be questioned how far this is good practice, as the winter rains wash the substance out of the manure before the plants are ready to be benefited by it.

In attempting to give a name to the average produce of the oats in the two counties, the same difficulty presents itself as in averaging the wheat. No doubt the variations in the seasons will not cause so much difference in the produce of the oat crop as in the wheat crop; the former being less liable to be affected by cold, wet summers than the latter. At the same time, the quality of the soil on which oats are cultivated is more unequal, comprising as it does at once the best and the worst, from the deep rich land along the shore on both sides of the Isle of Whithorn, or, if we cross the bay, the sound and productive soil on the shore of Fleet Bay, in the parish of Anworth, to the thin moorish land, half covered with small white stones—the emblems of its poverty—which has been reclaimed from the mountain far up among the heather. The highest produce we have heard of, and which is occasionally reached, is 84 bushels the Scots acre; the lowest among the mountain soils, 24 bushels. The mean of these two quantities is 54, which will be considerably above the average, which may be between 40 and 45 bushels.

Like wheat, oats, when sown on the same land repeatedly, soon deteriorates in quality. The grain begins to grow long and slender in the pickle, while at the same time a long black awn becomes attached to it. When this is observed, the sooner a change of seed is effected the better. East Lothian and Berwickshire are considered the best places to obtain seed from. An excellent change of seed is obtained from grain grown on the

clay soils, and it is much sought after by farmers on the hard land.

The number of acres of barley in both counties is 2188. This grain is generally grown after green crop, but it has been successfully grown on the lea, where the quality produced is very superior on suitable soils. Considerable judgment is requisite in selecting a proper soil for the growth of barley, and great care is necessary in having this properly pulverised and prepared for the reception of the seed. Sowing commences about the 10th of April, with the English or chevalier barley, and it is continued until the end of the month. The Scotch or common barley can be sown later than the chevalier, and is said to produce more bushels to the acre, but the quality is rather inferior. The colour of barley is generally darker when it is grown after sheep feeding on turnips, than when after potatoes, or on the lea. The quantity of seed sown is about 4 bushels the Scots acre, but where the land is well manured  $3\frac{1}{2}$  bushels are sufficient. The produce may be estimated from 60 bushels to 30 bushels the Scots acre, perhaps the mean 45 bushels will be the average. The quality varies from 56 to 50 lbs. the bushel. .

Beans are not extensively cultivated, there being 645 acres in the two counties in 1871. They are chiefly sown broadcast on the clay soils on the lea, having received previous to its being ploughed 20 or 30 yards of farm-yard manure. Good crops are also raised on hard land in drills, where they occupy the place of green crop. When the weather admits they are sown in March, at the rate of about 4 bushels the Scots acre. A few fitches or peas are mixed with the seed. The old "Moss of Cree" bean is not so generally sown as formerly, some of the larger varieties taking its place. Few beans are exported, the local dairymen buying up the produce for cow feeding.

Rye and peas occupy 184 acres and 12 acres respectively. The former is cultivated on soft, mossy ground, where no other grain would succeed. It is principally used for feeding purposes; the straw is much sought after by saddlers for stuffing their horses' collars.

The sowing of the cereals is mostly accomplished by hand, though broadcast machines have been in use for many years on some farms suitable for their working. Corn-drills have been recently introduced, and are growing in favour. A number of these machines were in use the last two years; but, owing to the broken nature of large portions of the cultivated ground, and the prevalence of stones on the surface, their use will necessarily be restricted.

Mr Mechi's doctrine regarding thin sowing has not met with much support in our northern climate. Whatever benefits may be derived from the adoption of that gentleman's ideas on this

subject in the south, where the summer is long and forcing, both theory and practice point out their inapplicability to every part of the country. Experience has shown very decidedly that grain, sown thinly in Galloway soils, does not ripen so early, nor is the produce of such good quality, as that which is sown moderately thickly. Take wheat, for example, sown in spring. If the plants appear above ground far apart, their first effort is to cover the intervening spaces by tillering. Before this can be done the best part of the summer is over when the flowering takes place, and the consequence is that the grains in the long open heads remain only partially matured, even in a favourable season, while in a damp summer they fall a prey to rust or mildew. The same remarks apply to oats; when sown thin they ripen unequally, and do not produce a fine sample of grain. The only exception to this rule is the wheat grown on the clay soils after fallow. When sown early in September the plants have sufficient time to cover all the ground before winter sets in, so that, when spring arrives, the main stems all being formed, the plants push on quickly to maturity.

### 9. *Harvesting, Thrashing, and Marketing.*

The harvesting of the corn crops in this wet climate is always a source of great anxiety to the arable farmer. Corn of all kinds generally grows bulky as to straw, and a wet day or two occurring before harvest, as not unfrequently happens, causes great havoc among the tall grain, making the cutting of it both troublesome and expensive. The first ripe grain is the autumn wheat on the alluvial soils, which is ready for cutting from the 1st to the 10th of August on the Baldoon lands. Harvest is not general until the 20th, in the average of years, on land within six or eight miles of the sea coast, while in the inland and higher districts it is much later. The grain is now cut down by machine, scythe, and hook,—the latter being only employed where machines cannot be used. Five-and twenty years ago nothing but the hook was used, there being no want of Irish shearers eager to be employed at 1s. 6d. or 2s. a-day, or L.2, 2s. for the harvest fee with victuals, or 5s. a-week for board money. Now, scarcely a man from the sister isle can be had except he is expressly sent for; and his fee for harvest, in 1873, was L.4, 10s. to L.5, with 9s. a week for board wages. The system of paying harvest men board wages is now common. This began to be introduced about twenty-five years ago, and is a decided improvement on the old plan, of feeding the men in the farm kitchen. The grain, when cut, is set up in eight or ten sheaves on the field, the good old practice of “hooding” being almost entirely given up. The abandonment of this custom is much to be regretted, as, when properly set up and securely covered by the “hoods,” a stook

will stand a great deal of rain without being wet through. In the disastrous harvest of 1872, wheat stooks with "hoods" were found to be not so much damaged by sprouting as where they were they were awanting. When ready for being put together the grain is carted to the stackyard, which is always adjoining the office-houses, built into round stacks of about 100 bushels each, and securely thatched and roped. No barns are provided for the grain. The stacks of grain, being built near to the thrashing machines, are taken down and thrashed as the straw is required for the cattle in the homestead during winter. These machines are driven by water, steam, or horses, the number of the horse-mills being now very restricted. It is preferred by some to thrash out a great part of their crop early in winter, and at the same time to forward the grain to market. This they are enabled to do very readily, as there are a number of travelling mills in the district, which have been a great convenience to the farmers. When these machines are thus employed the straw is carefully stacked up and secured, but cattle do not eat it so readily in winter as that which is newly thrashed, owing to the difficulty of keeping it quite dry.

Reference has been made previously to the distance at which the two counties are placed from good markets; and although these have been now brought within a reasonable distance by the introduction of steam, there still remains the expense of sending all that the farm produces to these distant markets. The cheapest mode of conveyance, by which the greater part of the produce of Galloway can be marketed, is by sea. Wigtownshire, with its 140 miles of sea-board, and nine or ten convenient shipping ports, placed at almost regular intervals along the coast, can never be said to be in want of outlets by which its produce of all kinds can be sent to market. The same remarks apply to Kirkcudbright, whose sea-board, though not so extensive, is furnished with several excellent shipping ports.

The chief markets to which the grain is exported are Liverpool, Lancaster, Preston, the Cumberland ports, Campbelton, and Glasgow. In favourable seasons the quality of the oats grown on the best soils is very good, and in spring bring a high price in the Liverpool market for seed. But it is only for the very best that the highest price can be obtained there, secondary qualities bringing comparatively low figures. For this description of oats Whitehaven is considered the best market, the expenses attending the shipment and sale being considerably less. Scotch wheat is not in favour in the Liverpool market, consequently very little of it finds its way in that direction from Galloway. Whitehaven and Lancaster, or Preston, receive nearly all the wheat exported, at which ports there is generally a fair demand for good qualities. There is a good local market in the



lower district of Wigtownshire for the greater portion of the barley sold, the Messrs McClelland purchasing between 20,000 and 30,000 bushels annually for their distillery at Bladnoch; what remains, after supplying several breweries, is shipped generally to Campbelton.

The expenses attending the marketing of grain are very considerable, the charges to and at Liverpool being the highest, and between freight, commission, and other items, amounts to 12 per cent. on the sales. A new market has been opened at Barrow-in-Furness, which, from its accessibility to Galloway by sea, is worthy of notice here. It has already established its name as a ready market for oats and wheat; and if the projected works are carried out, there is no doubt it will continue to be an excellent mart for all kinds of grain.

#### 10. *The Cultivation of the Green Crops.*

In 1857, according to the Government returns, there were 15,414 acres in Kirkcudbright, and 18,595 acres in Wigtown, under green crop; in 1871, 18,538 acres in Kirkcudbright, and 19,563 acres in Wigtown, making an increase of 968 acres in the latter county, and 3124 acres in the former.

The green crop occupies the second place in land under rotation, being immediately preceded by the oat crop on the lea. The first preparation for the green crop is the ploughing of the stubbles after harvest. Autumn cultivation and cleaning of the land from couch has been strongly recommended by many writers on agriculture; but, owing to the moist climate of the south of Scotland, this is rarely practicable. Where land is under good management, there need be little trouble with couch, and it may be said with truth of the majority of farms in Galloway, that the labour caused by this troublesome weed has now been reduced to a minimum. Five and twenty years ago it was different. At that time the fallows did not receive the same amount of attention they do now; consequently, it was no unusual sight to see fields, the cultivation of which had been deferred until late in spring, growing green with weeds, into which cattle or sheep had been turned to keep down the vegetation on the surface. With improved implements, but especially by a liberal use of lime and manure, couch in a great measure disappeared, so that in general the simple ploughing of the stubbles is all that is necessary.

The ploughing is always as deep as the nature of the soil admits. It is sometimes executed with three horses in the common plough, or with one plough following in the track of another; the first one turning down the surface furrow, the second turning up or loosening the soil underneath. As lime, where applied, has a tendency to sink in the soil, the advantage

of deep ploughing is very obvious. But the majority of Galloway soils do not admit of deep cultivation, especially those on till subsoils. This till is impregnated with a red oxide of iron, which gives it this colour, and is deleterious to vegetation, and, if mixed largely with the soil, destroys to a certain extent its fertility. In this case it is advisable only to stir the subsoil, so that the action of the lime, manures, and rain may gradually convert it into soil fit for the use of plants.

In spring, when land has a tendency to become foul, early cultivation is necessary before vegetation has made progress on the surface. Where this is the case with fallow, it generally receives a double turn of heavy harrows, the teeth of which are well sharpened, across the winter furrow before being ploughed, which much facilitates future operations in separating the couch from the soil; after being ploughed the harrows are again used; two double turns being necessary to bring it to the surface, after which the chain harrows are of great service in completing the separation of the couch from the soil. It is still the custom with some to burn the weeds taken from fallows on the field that has been cleaned. Little can be said to recommend this wasteful practice beyond the saving in cartage, and the facility with which they are got quit of at the time. If taken to the manure stead and rotted with urine, an excellent compound is formed valuable as a fertiliser.

With clean fallows, the work in spring, before being drilled, is comparatively trifling. A single furrow, followed by two double turns of the harrows, is generally sufficient on light friable soils. In some cases even the ploughing is dispensed with, and grubbing substituted. In dry scorching weather, such as frequently occurs in spring, the less light soils are turned the better. By exposing the under part of them to the sun, the natural moisture is dissipated, on the presence of which in the soil a regular braird of turnips depends, and besides, the humus compounds are wasted by the exposure. Occasionally, the drills are formed out of the winter furrow without any previous preparation except a double turn of the harrows. Where the land is friable and free from weeds, this method suits well, and generally ensures a regular braird in dry weather.

The drills are formed by the double-mould board plough, 27 or 28 inches for Swedes and yellows; while for mangold a width of 26 inches is deemed sufficient, and for potatoes 30 inches are preferred.

When artificial manures alone are used for turnips, the custom has hitherto prevailed of making the drills very shallow, with the avowed intention of placing the fertilisers near to the roots of the plants. This is a mistake. The roots of the turnip plant penetrate to a considerable depth in search of nourishment, and

the great object to be sought after in the cultivation of the Swede is to manure as much of the subsoil as possible, so as to entice the rootlets downwards, and to bring it into a condition fit for affording sustenance to the plants. For this reason the shallow drill system is beginning to be abandoned by many of its most zealous advocates, who have found out the advantages of placing the manures deep in the soil.

Manure distributors are beginning to be introduced, and, when they act properly, are a great improvement on the hand sowing. These machines sow the manures in rows in the bottom of the drills or broadcast; the former method is more generally approved of, as placing them more immediately under the plants, and in direct contact with the roots, as soon as the seed shall be sown. This theory may hold good in the earlier stages of the growth of the turnip, but if the manures are put *under* the plants, what is to nourish the lateral rootlets which spread out when the Swedes are in full growth during summer? At this time the small thread-like fibres, proceeding from the main roots, meet quite across the space between the rows, spreading in fact under ground as far as the leaves extend on the surface. Any one may satisfy himself of this interesting fact by examining the soil between the drills at the time the turnips have arrived at their full growth, when these minute fibres can be discovered under any flat stone, forming a close and beautiful network. These facts establish the importance of manuring all the soil, and of depositing the manure at different depths, so that in the process of hoeing some of it may be pushed into the space between the rows to become available during the future growth of the plants.

To attempt to enumerate and describe all the different manures in use would occupy a space exceeding the limits of this paper. We shall merely indicate the character of those most in favour, and now generally in use. From an early date in the history of fertilisers, the Galloway farmers, as previously alluded to, have preferred phosphatic manures to those containing large proportions of ammonia. This may have arisen from the moist character of the climate preventing the proper action of the latter; for it is an ascertained fact that ammoniacal manures require sunshine and dry weather for the proper development of their qualities. Be this as it may, the character of the manures in use has been determined very much upon this principle, and it is not considered advantageous or economical to have above three or four per cent. of ammonia present in manure applied to green crop.

“‘How do you mix your colours?’ was a question,” says the author of “*Horæ Subsecivæ*,” “put by a young artist to his more experienced brother. ‘With brains, sir.’” And there are more

things mixed with brains than oil colours. One of these is artificial manure preparatory to sowing. It is a fact worthy of note, that the farmer rarely applies any one of the many artificial manures by itself. There is somehow a want of confidence in any of them individually that leads to the mixture of them all, but upon what principle this is adopted has not been explained. In the case of guano it is different. Mejillones, with its 70 per cent. of phosphates, and less than 1 per cent. of ammonia, is not considered a suitable guano to apply alone. It is therefore mixed with nitrate of soda, sulphate of ammonia, Guanappe or other ammoniacal guano, so as to increase the percentage of ammonia. It is this principle that has guided the farmer in the application of light manures to the green crop, to the adoption of which he has been undoubtedly led by the effects of the climate and the results produced.

Bone manure has long been one of the most valuable and important of the fertilisers, and calls for a separate notice here. It has received, as it deserves, more of the confidence of the farmer than any other of the manufactured manures. Forty years ago the Old Mill at Eldrig village, Mochrum, commenced grinding rough bones, but for many years the machinery was in an imperfect state, as the large pieces of bone which had been applied to the land more than thirty years ago still turning up undissolved testify. There is also a bone mill belonging to a company at Innermessan, near Stranraer, and another at Dalbeattie, belonging to Messrs Biggar. Large cargoes are also imported from various quarters, more or less genuine. It cannot be said that the quality of this manure has been improved by the introduction of boiled bones. The gelatine which is extracted in the process of boiling is valuable as a manure, containing, according to Liebig, about 5.28 per cent. of nitrogen; the dry bones contain about 32 per cent. of dry gelatine. Yet to all appearance the bone manure in use contains a large proportion of the boiled bones, which, being almost destitute of ammonia, have only the phosphates to recommend them.

The quantity of manure applied per acre for Swedes varies according to the enterprise or ability of the farmer. Used alone, 6 to 12 cwt. of artificial manures and guanos is a common rate; and where it is desirable to raise the condition of the soil, 6 or 8 cwt. of bone manure is added. With farm-yard manure at the rate of 18 yards per acre spread in the drills, one-half of these quantities is considered sufficient. Heavy applications of farm-yard manure are not recommended, experience showing that larger crops are produced on less dung and a mixture of guano or bones. In some parts of Wigtownshire the farm-yard manure is reserved for the succeeding wheat crop.

The sowing of Swedes commences from the first week in May

to the middle of the month, and is continued until the first week in June, after which the sowing of the yellow turnips is proceeded with. The thinning is performed by the hoe or the hand; by the latter mode the plants are left at a more uniform distance than with the hoe, but the hoe stirs the land better, and rids it of weeds.

The climate of Galloway is, in general, favourable for the cultivation of the green crop. On some favoured spots near the sea shore very heavy crops are raised, occasionally ranging from 40 to 50 tons per imperial acre; but 30 tons is considered a good yield, while on land that has been long under crop 20 tons is a fair average.

Swedes grown on artificial manures and bones keep better in the ground in spring than those manured with dung, so that it is found desirable to secure these against sudden frosts in the inland districts. A variety of opinion exists as to the best mode of storing turnips. In the interior, where the frosts are severe, this operation commences in November. The common way of doing is to place the turnips in narrow pits of 6 or 8 loads each in the field for sheep feeding, covered with straw and as much earth as will turn a moderate frost, which must be removed early in spring. Those not required for sheep are carted to the homestead and secured there. Where game is plentiful, storing is absolutely necessary, whatever the character of the season may be, and that portion of the green crop that cannot be got covered in pits is generally covered up with the plough in the fields; if properly done in this way, the roots keep fresh until spring.

The extent of land under mangold in 1871 was 35 acres in Kirkcudbright, and 210 acres in Wigtownshire. With the exception of Ayr, the latter county has the largest acreage of this useful root of any county in Scotland. Five and twenty years ago little or no mangold was grown; the cultivation of it is now gradually increasing. It cannot be said that the climate is very favourable for the growth of the mangold, yet occasionally good crops are grown on suitable soils when well manured. It agrees with being long in the ground, and is sown before the end of April. Deep strong loam is selected for the cultivation of it; one-third more of manure being required than for Swedes. As it is easily damaged by frost, it requires to be lifted by the end of October. The pits are made about 6 feet wide at the base, thatched with straw for a few days to allow any moisture to escape, and afterwards covered with sufficient earth to resist hard frost. It will keep until the following summer if pitted dry, and is valuable in May and June for feeding cattle, for which it is chiefly used.

Potatoes occupy 5735 acres in the two counties. They have been since 1845 a very precarious crop in this moist climate;

the quantity cultivated is mostly required for local wants. A few are exported, and some preserved at a manufactory near Wigtown. The largest breadths are grown on reclaimed moss, where they thrive well, and are comparatively free from disease. The produce of the mossland is in demand for seed.

Few carrots being cultivated, they scarcely demand more than a passing notice.

### 11. *Galloway Cattle.*

The Blue Book returns for 1871 gives the number of cattle of all kinds in Kirkcudbright at 37,937, and in Wigtownshire 39,111, making in all 77,048. These consist of different breeds—Galloway, Ayrshire, Highlanders, and crosses. There are no shorthorn stocks in the district; but bulls of that breed are imported from other places for the purpose of rearing crosses with the Galloway or Ayrshire cow, the former producing fine animals, coming early to maturity.

The Galloway cattle, though much fallen off in point of numbers, have long occupied an important place in the rural economy of the south of Scotland. Possessed of a hardy constitution, and covered with a profusion of long hair, they were well adapted to stand the rigour of a mountainous climate, before shelter was furnished for them in modern farm buildings. Reared originally for the most part on the higher and unenclosed grounds, in the northern portions of Galloway, they were taken down to the cultivated ground, where they were kept until they were four and sometimes five years of age, and then sent south to the English markets. Sir David Dunbar, just before his death in 1682, formed all the low lands, called at that time the Baldoon lands, into an immense park for the rearing and fattening of black cattle for the English market. This park contained above 1800 acres, and would keep 1000 head of cattle; it was kept in grass for the greater part of a century. It is said to have been one of the finest sights of the times to be present at the gathering of these cattle into droves, previous to their departure for the south. Their natural wildness made this no easy task, and the assistance of all the neighbours far and near had to be obtained. Frequently, however, when just on the eve of starting, the whole herd would suddenly set off, and, in spite of all the help that could be mustered, regained their pastures. There is a breed of the Galloways among the Minnigaff hills that still to a certain extent retains this wildness, so much so, that the appearance of a stranger's head over the summit of the hill is the signal for a general dispersion. Modern treatment has in a great measure deprived the black cattle of their natural timidity, and with regular housing and feeding they have become quiet and docile.

The principal rearing ground for the Galloways in Wigtownshire is on both sides of the waters of Bladnoch and Luce, where large quantities of meadow hay are cut, upon which the black cattle are wintered, for the most part out of doors, on any rough and sheltered moor. In the parish of Mochrum, containing 25,600 acres, there are many good stocks of Galloways, which are either reared on the ground or bought in, there being no dairy of importance in the parish. Further inland, in the upland districts, there are a few Galloway cows kept on every farm where the elevation is too great for the Ayrshire stock.

In Kirkcudbright the black cattle some years ago reigned supreme among the grassy glades and higher lands in Minnigaff, the black-faced sheep occupying the tops of the hills. Lately, however, the number of cattle kept has been on the decrease, sheep stock having been substituted. For instance, on the farm of Polgown five or six mowers used to be employed, now one or two men can cut all the hay required. In the lower districts the Ayrshire cow occupies the place where the Galloways at one time predominated, and on the land up the water of Dee, where fine cattle were wintered not long ago, little hay is now made; but the entire pasture is given up to sheep. Lord Selkirk keeps a stock of twenty Galloway cows, and there are several breeders in that locality whose names appear on the prize lists, among whom may be mentioned Messrs Shennan, Balig; Thomson, Blaiket; Cunningham, Tarbreoch; Biggar, Chapelton. These gentlemen, for the most part, breed bulls for sale, and keep comparatively little store stock.

Regrets are expressed on every side concerning the gradual lessening of the numbers of the Galloway stock, and a variety of opinions advanced as to the cause. The chief reason given by the best informed on this subject is, that the Ayrshire cows yield a larger return, and that the Galloways require to be kept until they are aged, and do not agree with the forcing system so much in vogue now in feeding cattle at two years old. As an illustration of what Galloways can be brought to at that age by good management, we will cite one example of a successful breeder in Wigtownshire—Mr M'Whinnie, Airyhollland—the details of which will also serve to show the general principles upon which the breed is reared. This farm occupies rather an exposed situation facing Luce Bay, by which it is bounded on the south-west, and gradually rises from the sea until it reaches an elevation of 400 feet. The surface is much broken up by immense boulders of blue stone, which gives the country in that locality a very rough appearance, and makes the cultivation of the soil both difficult and expensive.

A stock of twelve cows is kept, which all calve in February. The calves are suckled, and get the half of their mother's milk,

or, as the custom is, the milker takes two teats, while the calf gets the other two. As soon as they can eat the calves get good hay or oat straw, and turnips cut small. They suck on to October, or as soon as a young grass field is cleared, getting half a pound of cake daily all summer, which is increased to one pound when they are weaned. When the sown grass begins to fail they get turnips on the old grass, which, with the cake, are continued all the winter, the quantity of turnips allowed being 1 cwt. each. The calves are wintered out, and are never in a house after they leave their mother.

The second winter they get ryegrass hay, 1½ lb. of decorticated cotton-cake, and 1 cwt. of turnips each daily; they are foddered regularly once a day in the morning. They are all sold at two years old, and with the treatment we have been describing make splendid animals at the age. In the spring of 1873 two of these were sold to Mr Cunningham, Tarbreoch, for L.55; the remainder of the lot brought L.24, 10s. each.\*

In general, black cattle do not receive cake when stores, but are wintered chiefly on hay or oat straw. They are disposed of in early spring to purchasers for the English pastures; Mr Burrell of London, and Messrs Welsh, Newton-Stewart, being extensive buyers. Large numbers are also purchased by local graziers for "summering" on the better class of soils, and these are either fattened off on the old grass pastures with the assistance of cake, or reserved for stall feeding during the ensuing winter.

## 12. *The Rearing, Wintering, and Grazing of Cattle.*

Besides the Galloway cattle bred in the counties, the particulars of which have already been adverted to, a considerable number of crosses are reared between the Ayrshire cow and the shorthorn bull, which are most commonly kept on the farms where they have been brought up, and made fat for the butcher at two and sometimes three years old. When calves they are not allowed to suck, but are fed from pails, and for the first two or three days always with their mother's milk. They get three chopins or English quarts at a time, twice a day, till they are three weeks old, after which their allowance is gradually increased, and linseed meal dissolved in water, or oatmeal porridge well boiled, added. By the time the calves are four weeks old they have learned to eat turnips cut small with the sheep-cutter, and if given fresh and clean will consume a considerable quantity. Hay and linseed-cake are placed before them in small quantities, and they soon come to eat half a pound of the latter. The milk is continued throughout the summer, until each calf

\* Mr McWhinnie's herd of two-year olds, which sold at this price, consisted of twenty, he having bought in eight stirks, which received the same treatment as his own calves.



has taken about L3 worth ; but frequently the oldest are weaned before they have incurred so much expense, so that the younger ones may be brought well forward before winter. In some places three calves are reared from one cow, and when that is the case, the allowance of milk is necessarily limited, linseed meal being the chief substitute.

The calves are generally weaned sooner than the Galloways, namely, about August, or as soon as the hay stubble is cleared, after which a liberal allowance of linseed-cake is given, say 1 lb. a day for each. English cotton-cake decorticated is found to answer the purpose nearly as well as linseed-cake, and is much cheaper.

Mr Hughan, Cults, Sorby, combines butter-making with the rearing of calves, which, at the present price of stock, appears to be a profitable combination. We give an outline of the whole management :—

From forty to forty-four Ayrshire cows are kept, which are crossed with a shorthorn bull. The milk, as it is drawn from the cows, is strained into zinc coolers, 5½ feet long by 33 inches wide, and 4 inches deep, where it remains until it is sufficiently cool, when it is drawn from the coolers, and put into a barrel large enough to hold the whole evening's or morning's milk. It remains in the barrel from 36 to 48 hours until it is thoroughly thickened, or as it is locally termed "lappered." The thickened milk is then put into a churn which is driven by a horse, and after getting two or three turns to mix the cream and milk, one-eighth part of water is added, at a temperature of 80° or 90°, according to the heat of the weather. By this means the milk in the churn is raised to 60° or 68°. In frosty weather the water is often heated to 100°. The churning generally lasts about an hour ; if it is done more quickly the butter is soft. When the cows are in full milk churning takes place twice a day, and three or four times on Saturday. The butter is washed in cold spring water, after which it is salted at the rate of 1 lb. of salt to 24 lbs. of butter, packed solidly in barrels, holding from 50 to 100 lbs., and forwarded to the Glasgow market.

The calves are all kept, and fed from the pail. The first week they each get one quart of new milk twice a day. The second week, two quarts twice a day. The third week, butter milk is gradually added to the new milk, so that by the end of that week, they are getting one quart of butter milk added to two quarts of new milk twice a day. The fourth week the new milk is gradually reduced, and butter milk added, so that by the end of that week the calves are wholly fed on butter milk, getting three quarts twice a day, brought to the heat of new milk, by adding a little hot "brochan" made from oat or linseed meal. As soon as they show a desire to eat, they get a little rye-grass,

hay, or oat straw, with a small quantity of pulped turnips, until they are put to the grass. The same quantity of butter milk and "brochan" is continued, till they are from five to six months old, when they are gradually weaned, and put to grass in a sown out-field. During the winter they are all tied to stakes in the calf-house, and kept in a growing condition, their food being straw and turnips with a little oil-cake. As soon as there is sufficient grass in April, they are turned out and grazed until October, when they are tied up, and fed on straw and turnips sliced till February. After that they get an allowance of artificial food increased gradually during the spring from 2 to 6 lbs. per head daily. They are kept until the middle or end of May, when they are sold fat.

Crosses are seldom wintered out of doors, but require to be housed early in the season to prevent loss of condition, which is apt to ensue in October, especially in wet weather. The skin and hair of a shorthorn or cross bullock being considerably thinner than those of a Galloway, the former suffers much from exposure where the latter will thrive. In the summer and autumn numbers of Irish young cattle are brought into the counties to be wintered or stall fed, but it is found by experience that these cattle take more kindly to the stake after having been some time in the district.

In wintering young cattle it is of great importance to have proper conveniences for classifying the stock, thereby separating the weak from the strong. In the construction of the most of the Galloway steadings sufficient attention has not been paid to this, it being not uncommon to see 40 or 50 cattle together in one large open court yard. A good many of this number cannot thrive; the strong push the weak about, and, instead of making improvement, many of the smaller class lose condition, and frequently die during rough weather in spring. Some prefer keeping the young cattle tied all winter, so that each may get its own allowance of food without being disturbed. This system, no doubt, has its advantages, but in general it will be found that store cattle will do as well during winter in small numbers together in open courts, where they can be sheltered without being kept too warm, and, if properly classified, and with plenty of room, there will be few, if any, kept at the outside.

Young stock in the early winter thrive well on the green turnip tops; these are scattered over the field where the cattle are allowed to go out during the day; and, when put into the shed at night, they eat greedily of the oat straw, which forms the great bulk of their food during winter. As spring advances the decayed turnips are selected, and given to the store cattle, and the sound tubers left to the feeding stock. A cart-load of the unsound turnips will keep a score of young beasts in grow-

ing condition. Where turnips are not available, uncorticated cotton-cake is a good deal used, and is coming more into favour. Calves, however, do not agree with it, the particles of cotton adhering to the cake are said to produce obstruction in the bowels, and in some cases to cause death.

At one time little attention was given to the progress wintering cattle made, the question was more the numbers that could be brought through than their improvement, and consequent increase in value. With cattle, at their present price, the stockmaster must not be satisfied with seeing his "winterers" remaining stationary, but should aim at steady progress all winter, which can be attained, where turnips are not to be had, by the use of artificial food. The straw-cutter is a valuable acquisition in the wintering of young cattle, but the merits of this machine have been long in being admitted in Galloway. With the straw cut into half-inch lengths, and mixed with pulped turnips into which any kind of cheap meal may be introduced, an excellent compound is produced, upon which the cattle thrive well. When turnips run short in spring, the cut straw is steamed, or boiled along with ground Indian corn, at the rate of two pounds for each animal per day. A few handfulls of bean meal sprinkled over this mixture cause the cattle to eat it with avidity. In this manner a great deal of valuable straw can be utilised for winter feeding, much of which would otherwise be trodden under foot and wasted.

Wintering cattle are generally kept in the courts until there is a good appearance of grass in the fields, and the weather is somewhat warm; those intended for feeding next winter being put to the best pastures, so that they may be well forward in condition by the beginning of October, about which time they are tied up in the feeding byres.

### 13. *Cattle Feeding.*

The system of rearing and feeding cattle for the fat market has long been an important department in Galloway farming. The extension of turnip husbandry with the opening up of the English markets, and the use of auxiliary feeding stuffs, have given this system such an impetus that it may be said to be now the chief spoke in the wheel of the arable farmer who does not follow the dairy system.

The price of beef fluctuates much more than that of dairy produce, and if the feeder finds himself obliged, from want of "keeping," to bring his fat stock to market at a certain time, which may occur during the prevalence of low prices, the result may be a serious depreciation in his profits. It is no unusual occurrence for the price of a fat bullock to vary as much as L.2 or L.3 in the course of a season; and in the spring and summer of

1873, there has been a difference of 2s. per imperial stone in the price of beef, making L.6 in a steer of 60 stones weight. No doubt this uncertainty has induced many to abandon the feeding, and to adopt the dairy system, the produce of which is less subject to violent fluctuations in price, and is more of a steady-going character. Notwithstanding these changes, the importance of the feeding system may be gathered from the following statement:—

During the year ending 30th of June 1873, according to returns furnished by the Caledonian and Glasgow and South-Western Railway Companies, and also by the Galloway Steam Navigation Company, it appears that the total number of cattle sent out of the counties by these conveyances was 14,569.\* Of this number it is computed that about 8000 were sent to the fat market; the remainder being stores which had been wintered, or reared in Kirkcudbright and Wigtown. The estimated value of the fat cattle we may place at L.23 each, which gives a total of L.184,000.

The first object of the successful feeder is to obtain suitable and well-bred animals for the purpose, whatever breed they are. Well bred cattle will pay for a liberal outlay for extra food, while mongrel and ill-shapen beasts will not. The different markets in the counties afford opportunities for obtaining good stock for winter feeding, but the lots exposed for sale are generally mixed by dealers, and care in selection is necessary before the herd can be made up. The October markets at Newton-Stewart, Castle-Douglas, and Dumfries are the most important for buying in feeding cattle, at which there is commonly a large show of first-class animals, chiefly Galloways. At these markets are shown cattle that have been “summered” in the higher districts, which are bought for stall-feeding in the arable farms, their places being filled up by a smaller class suitable for “wintering.”

The usual time for tying up feeding cattle is from the 1st of October to the 1st of November. If they are intended to be ready by Christmas, they are put in sooner, as it is found bad policy to allow cattle in good condition to remain too late on the field in autumn, exposed to the cold nights and washing rains which prevail at that season. The yellow turnips are commenced with first, of which a moderate-sized bullock will eat 2 cwt. a day. The usual hours of feeding are, turnips at six in the morning with straw afterwards, turnips again at nine or ten and at two afternoon, and finally turnips and straw at five, when they are done up for the night. At eight the cattleman comes to see that all is right, and to add some fresh fodder, and trim up the bedding, but this visit is only during the continu-

\* This number does not include the Irish cattle landed at Stranraer by steamer, and sent on by railway.

ance of the long winter nights. Some years ago the older and well-bred Galloways used to be fed fat without much extra feeding,—turnips and straw only being used. Of late, probably, owing to the frequent repetition of the green crop, turnips are not so nutritive as formerly, so that considerable expense is now incurred for purchased food, varying from L.2 to L.3 each bullock. Where aged cattle are fed, it is not usual to commence with the extras sooner than six weeks or two months before they are sent to market, though in some cases grain is given to the cattle shortly after being tied up, which not only shows speedily in the improvement of the beeves, but also effects a saving in turnips.

Bruised oats, owing to the deficient quality and low price, were used extensively in the winter of 1872-73 for feeding. These are found to suit best in the early part of the season when the turnips are full of sap, but from the heating nature of this food they are not continued alone during the spring, linseed cake being used along with them. The grain and cake are placed before the cattle about mid-day in wooden boxes made for the purpose, but where the fire-clay troughs are used the boxes are dispensed with, the rounded bottoms of the former rendering them easily cleaned out, which they ought to be always once a day; for, as in the dairy, cleanliness is of the first importance, so it is in the feeding of cattle, where anything that would produce heavy smells about the troughs is carefully guarded against, and everything around kept fresh and sweet.

Where young growing crosses are fed, the treatment they receive is on a more liberal scale. This, however, often depends in some measure on the supply and quality of the turnips. With careful feeding on good, clean, and sound roots, along with fresh, well-got oat straw, it is surprising how much progress well-bred cross or shorthorn bullocks will make. Still it is considered by many that, on the whole, the liberal system pays best; and where this is adopted, the cattle begin to get grain by Christmas, some even commencing as soon as they go into the house. This is continued through the winter months, and by March the oats are discontinued and bean-meal substituted, with the addition of 2 lbs. of linseed cake and 2 lbs. of cotton cake daily for each animal. Mr Rodger, Penkiln, Sorby, who feeds about 100 cattle every season, allows each from 8 to 10 lbs. a day of different kinds of cake and Indian corn meal. The meal is steeped in boiling water over night, and next morning mixed with chaffed straw, among which it remains for some hours before being given to the cattle. By this system a great saving of turnips is effected, and the cattle make more progress than when consuming double the quantity of roots. Mr M'Monnies, Sorby Farm, also uses the straw-cutter for chaffing the hay or straw for feeding

cattle. The cut straw is made damp, so that the bean meal adheres to it, and in this way there is no loss. The system followed at North Balfern differs in detail from either of the foregoing, and was adopted several years ago with a view of economising turnips, the production of which have now become so costly. The herd fed annually, in number about 80, consists of crosses or shorthorns. The extra feeding they got was commenced as soon as they were tied up in November 1872. It was 2 lbs. of Indian meal, 2 lbs. of damaged wheat ground, and 2 lbs. undecorticated cotton cake daily for each. The meal was boiled the day before being used with chaffed oat straw cut in half-inch lengths, to which was added a few sliced turnips, each animal being allowed 5 lbs. of cut straw. When about to be used, the mixture is put into the feeding-waggon, and the meal, which gets into lumps after being boiled, thoroughly broken up and mixed with the cut straw; the damaged wheat was also added at the same time. The cattle were fed with about half a cwt. of turnips in the morning, the boiled food between ten and eleven, the cotton cake at one, and half a cwt. of turnips at night.\* As the spring advanced bean meal was substituted for the wheat, and 2 lbs. of linseed cake added to the cotton cake. The expense of this extra feeding was 2s. 9d. a week, exclusive of coals, which cost 1s. 6d. for the season for each animal. These cattle made very satisfactory progress. It is worthy of remark, that crosses or shorthorns take better with the boiled food than the Galloways.

Where mangold and hay are grown, the use of them is reserved until the spring, and they are always given to the feeding stock in conjunction. These roots, when they have been carefully stored, retain their feeding properties long after the Swede is useless for the purpose—indeed, the quality of the mangold is rather improved by being kept until May. It is a valuable feeding root where young cattle have to be kept late in the spring; it is also found of the greatest service in maturing aged cattle where the quality of the Swedes is deficient.

The best markets, and those most easy of access to cattle fed in Galloway, are Liverpool, Glasgow, and Edinburgh. For large Galloway cattle of fine quality London is said to send the best returns; whereas for rough half-fed beasts Edinburgh or Glasgow is the best market. Liverpool, however, takes the great bulk of the fat cattle which are sent by sea and rail. The marketing expenses of a bullock worth £30 are about 23s., which in a large lot of cattle amounts to a heavy charge.

\* The cattle fed on this farm being two years old, the turnips are sliced by one of Samuelson's cylinder slicers driven by water power.

#### 14. *Sheep and Sheep Breeding.*

The total number of sheep of all kinds in the two counties, according to the Government returns in 1871, was 493,557, of which 366,647 were in Kirkcudbright, and 126,810 were in Wigtown.

The largest proportion of these consists of the blackfaced or mountain breed—which is treated of separately—the remainder is made up of Cheviot ewes and half-bred lambs, half-bred ewes and lambs, crosses and other breeds, with the year-old sheep of their respective kinds.

Of late years the arable farmers on the lower parts of Galloway have been going more into sheep breeding than formerly. The rearing of lambs has been profitable for two years past, and, owing to the high price of labour, more land has been allowed to remain in grass, which generally has been devoted to this purpose. There are, however, few full stocks of breeding ewes kept. It is preferred rather to combine sheep feeding with the rearing of a few lambs on the farm; and more attention has hitherto been bestowed on the former than on the latter.

The ewes preferred are the Cheviot, procured chiefly from the Highlands, and the half-bred. The rams most in use are the Yorkshire or the Lincoln. The Cheviot ewe, it is considered, rears a stronger lamb, and as a hogget it pays better for keeping in summer than the hogget from a half-bred mother. The latter comes early to maturity in spring, and becomes fat with little extra feeding. Care is necessary in the selection of the rams for breeding with half-bred ewes—the lambs, with some sires, have a tendency to become small in the neck, which betokens a want of growth about the animal. With the Lincoln ram an excellent breed is produced, combining strength of bone with good substance and a heavy fleece.

The rams are put to the ewes about the 20th of October, and for a short time previous to this the ewes are put to fresh grass, so that they may be in a thriving state when they receive the ram. If this is attended to, the number of lambs is thereby increased. Ewes are not often wintered solely on turnips. When the pastures are bare, cotton cake or a few cut turnips on the grass are given. These are increased in quantity some time before the lambing season comes on.

Lambing commences from the middle of March to the end of the month. The lambs are castrated when the weather is moist and cool. They run with their mothers until the 1st of August, when they are weaned and put into a field of young grass, and kept in a growing state by changing their pasture frequently until they are put on the turnips.

Some crosses between the blackfaced ewe and Yorkshire ram

are reared on the low grounds ; they are frequently sold as lambs in the fat market. A number of cross lambs are reared on the higher ground at the foot of the hills. They are disposed of at the fairs in autumn, and are wintered on turnips ; but the greater part of them require to be kept over during the second winter on turnips, when they make good sheep early in the spring of the following year.

An attempt has been made to introduce the Shropshire Downs ram to cross with the half-bred or Cheviot ewe, but the produce both of mutton and wool has proved deficient. There are few of them kept now.

### 15. *Sheep Feeding.*

There is, perhaps, no department of agriculture in which more improvement has been made during the last twenty-five years than in sheep feeding. Prior to 1848, before the introduction of the turnip-cutter, it was never attempted to make year-old sheep fat on turnips. The loss of their teeth from eating the hard Swedes was greatly against the progress of the hoggets, even when they came to the grass, so that it was well on in summer before they could be got fit for the butcher. Indeed, at the date referred to, comparatively few lambs were fed on turnips, partly from the difficulty of getting them disposed of in spring, and also from the small returns left, owing to the backward condition of the stock before the grass came.

The number of sheep embraced in the Government returns for Kirkcudbright and Wigtown, on the 25th of June, includes only a small proportion of those that are fed in winter on turnips. Large droves of Highland wethers, purchased at Inverness or Falkirk trysts, find their way in the autumn down to their feeding ground on the turnip break. These are all fattened and disposed of early in the spring of the following year. Great quantities of lambs, purchased at Lockerbie fairs and throughout Dumfriesshire or Ayrshire, are brought into Galloway to be wintered on turnips ; they also are in a great measure disposed of in spring or early summer, and are not included in the returns for the counties. It is to the consideration of the management of these that we now wish to direct attention.

Highland wethers purchased at Inverness generally arrive at their winter quarters about the end of September. The time occupied on the journey from Sutherland to Galloway is about thirty-five days. From Falkirk the time occupied is from twelve to fourteen days. Railway communication, of course, shortens the journey from either of these places ; but the expenses incurred by the trains are fully as heavy as when the sheep walked all the way. Several cargoes are likewise imported by sea every year from different parts of the Highlands. After coming off



their long journey, considerable care is requisite to guard against scab. Formerly the sheep were poured with a mixture of tobacco juice, soft soap, and spirits of tar; now scarcely such a thing is thought of, dipping universally taking the place of pouring. The wethers on arriving are put on stubbles, or any other rather bare pasture, for a few days, and gradually advanced to more succulent herbage. By the 1st of November they are enclosed on the common turnips; nets and stobs or stakes are used for that purpose. The usual way of feeding wethers on turnips is to remove one half of the crop, or whatever proportion is required at the homestead. This proportion is taken out at regular intervals, so that the manure of the sheep may be equally distributed over the field. The stock also thrives better in this manner than when they have to eat the whole crop on the ground. They are enclosed in lots of twelve or fourteen scores together, which one man can easily attend to; and it is of the utmost importance that they should not be confined on too small a space, but have room to move freely about. The system is now being introduced of using the turnip-cutter for wethers as well as for lambs. This, of course, prevents waste, which to a certain extent is unavoidable in wet weather. Grain and linseed cake are also supplied in boxes made for the purpose—about half a pound a day of each of these being considered a liberal allowance for each sheep. Indian corn being moderate in price in the winter of 1872-3, the writer used it exclusively as extra feeding for a lot of once-clipped hogs. Each of them consumed about 2 lbs. a day, which, at the price paid for it, amounted to 10d. a week. They were fed on a grass field, and were allowed, besides the corn, half a ton of turnips, with the tops on, to every four score every alternate day. They made great progress, and increased in value about 15s. each in nine weeks.

The first shipments for the fat markets generally commence in January, according as the prices rate or the appearance of provision indicates. They are sent to Liverpool by steamer or rail, and also to Glasgow, and the cost for carriage, commission, and other expenses is 2s. 6d. a head; by rail it is considerably more. By the middle of April the wethers have all been disposed of, and by that time the first of the hogs are ready for being sent to the market without the wool.

Lambs are also extensively fed during the winter. Large numbers are bought for the dairy farms to eat the surplus turnips, and for the most part are sold early in spring in the wool without eating any grass, which is reserved for the dairy stock. Besides those obtained from Lockerbie fairs and the neighbouring counties, a considerable number are reared on the farms, where they are fed and disposed of early in spring in the wool, or where "keeping" can be obtained for them for a

longer period without their fleeces. Like their seniors from the north, lambs which have stood the market, and have been travelled from a distance, are all dipped as soon as possible after arriving at their destination. Biggs' dip is extensively used for both sheep and lambs. while some prefer M'Dougal's. The former gives the sheep a clean and washed appearance, while the latter imparts a dark colour to the fleece, and is supposed by some to render the wool partly waterproof. The lambs on coming home from market are put on to a fresh, clean pasture, and great care is required to keep them in a thriving state on the grass during and after harvest, which is considered a most important period for the future growth and well-being of the stock. For this purpose young grass and seeds, and the aftermath of hay or clover, are preferred. Before the pasture becomes exhausted, the lambs are removed to their winter quarters on turnips, the softer varieties being used for learning them to eat. They thrive well on the common or yellow kinds without cutting until January, though the practice is gaining ground of cutting these even to avoid waste.

A great advance has been made lately in the method of feeding lambs, though occasionally we see a want of care in supplying the turnips in small quantities at a time, and just as the sheep can eat them, which we have have no hesitation in saying will deprive the stock-master of a large part of his profit. A good deal of experience and care is required in the shepherd who has charge of a flock of lambs on turnips during winter; but by many it is still the custom to employ an inexperienced boy as shepherd, a course to which may be applied the proverb, "Penny wise and pound foolish." The most successful feeders are very careful, in the first place, to have the turnips put together in the heaps on a dry day, when little earth is adhering to them. The heaps are then carefully covered with straw and a little earth, to prevent the changes in the weather from affecting them. By these means the sheep are always supplied with clean and wholesome food, so that they may be kept constantly in a thriving condition.

Extra feeding is now given to lambs more generally than was the case four or five years ago, and more particularly during the winter of 1872-73. Various compounds are in use, but the basis of them all is the staple produce of the province, oats. Some feeders give oats, and oats alone, to the extent of 1 lb. per day, given twice a day. Others use a proportion of linseed-cake with the oats. A cheap and palatable mixture consists of the following:—Oats and cotton-cake,  $\frac{1}{4}$  lb. of each, with  $\frac{1}{2}$  lb. of Indian corn to each sheep. In the month of February the Indian corn was reduced to  $\frac{1}{4}$  lb., and the same weight of linseed-cake substituted. This was used with success by the

writer last winter, and the cost was about 4½d. a week per head. There is a danger in giving sheep too much dry feeding; the ruminating functions are apt to become deranged, and loss of appetite ensue. When this is the case, the constituent parts of the extra food should be changed, and linseed-cake or locust beans in part substituted. An excellent compound is in use in the Rhinns district, which is well reported of, not only for its fat-forming properties, but also as keeping the sheep in good healthy condition, and effecting a considerable saving in turnips. The mixture consists of crushed Egyptian beans, bruised oats, chaffed sheaf corn or hay, well turned together, and the whole wetted with dissolved molasses. The mass is then thoroughly mixed with about an equal bulk of draff, and allowed to remain in a heap until fermentation begins, when it is ready for use. The proportions of the different ingredients are varied at pleasure, and according as the sheep take to the mixture, of which they generally eat from 6 to 8 lbs. a day. The draff is obtained from Campbelton, and when salted keeps for a considerable time.

The best sheep-feeding land in the Stewartry is on the blue stone or gravel soils. It is a popular saying, that the granite and sandstone grind away the fat out of the sheep, whereas the blue stone lays it on. It is a fact, however, that sheep will not live on the granite soil more than a year without becoming unhealthy; the *rational* of which may be, that a part of the fine and loose granite or sandstone finds its way into the sheep's stomach along with the grass, producing "fluke" on the liver, similar to what is caused by feeding on meadows that have been flooded. The rock soils are by far the best adapted for sheep-feeding in winter, not only from the shelter the undulating and broken land affords, but from the open and porous subsoil preventing the water from lodging on the surface. A fine tract of land of this description extends along the shore in the southern part of Wigtownshire; but being somewhat exposed to the east and south winds, the strong sea air along the coast prevents the sheep from making progress. When the wind blows continuously off the sea the wool of the sheep becomes of a bluish colour, indicating want of tone in the system; and when this is the case, a change farther inland becomes necessary. The till soils are not well adapted for winter feeding; the feet of the sheep in wet weather soon "puddle" the surface, and keep the soil wet and disagreeable.

—Clipping the hoggets commences in the Stewartry about the beginning or 2d of April. Some very fine year-old sheep are sent by steamer and rail from the farms in the neighbourhood of Kirkcudbright, among which the names of Messrs Gifford, Ingleston; Phillips, Carse; Williamson, Sypland; Sproat, Borneess; Currie, Southpark; and Biggar, Chapelton, stand prominent

In Wigtownshire, clipping is rather later in commencing, few lots being sold without the wool until the 1st of May. Messrs Welsh, Newton-Stewart, do a large trade in slaughtering rough hogs for the London market, sending the carcasses by rail in a van expressly fitted up for the purpose.

Without multiplying instances, we will only adduce two examples—one from each county—of the extent to which, by careful management and liberal treatment, sheep may be developed at a year old.

The first is a lot of lambs bred in Wigtownshire from Highland ewes and Leicester rams. They were clipped and sent to Liverpool in the second week of May 1873, where they were sold to average L.3, 7s., and taking off expenses, left L.3, 4s. 6d. per head. The wool averaged  $7\frac{1}{2}$  lbs. per fleece, which, at 2s. the lb., gives 15s., making in all L.3, 19s. 6d. for each sheep. Two out of this lot of hogs were sold to a butcher, which weighed 103 lbs. and 101 lbs. respectively.

Mr Gifford, Ingleston, Kirkcudbright, reared a lot of lambs the same year from half-bred ewes and rams from Mr Bell Irving's stock, the produce of which was sold in the end of April at L.3, 3s. without the wool, which averaged  $8\frac{1}{2}$  lbs., and cleared 17s. the fleece, making in all L.4 for each sheep. Besides turnips during winter, these sheep were fed with oats and cake from the beginning of February, at a cost of 5s. each, the oil-cake costing 2s., and the oats 3s. Among the gentlemen whose names have been mentioned in connection with feeding, a good deal of emulation prevails as to who can turn out the best hogs in spring, and extra feeding to the extent of from 7s. to 10s. is given. It is questionable how far this expensive feeding will pay, but it depends a good deal on the class of sheep to which it is given.

We have been thus minute in giving the details of the management of this important branch of the agriculture of the district, convinced that the proper system of sheep-feeding is only beginning to be understood, and this remark applies not only to Galloway, but to the other districts of Scotland. If we can apply the products of Egypt or prairies of America to the production of beef and mutton in this country, surely a great point has been gained by which our teeming population can be supplied with these important and costly articles of food.

The total number of sheep exported from the two counties by sea and rail during the year ending 30th of June 1873, was 145,492.

### 16. *The Moorland, and the Mountain Sheep.*

As formerly noticed, there are 620,040 acres of mountain or moorland in the two counties. It occupies the northern and

inland part of Galloway; the land along the sea-coast being for the most part all arable. A portion of it is of a poor, barren description, so much so that, according to a local saying, "it would not graze a peesweep\* to the acre." The greater part of it, however, is very suitable for sheep and cattle grazing, especially towards the north and north-east of Kirkcudbright, where the hills in the parish of Carsphairn are green to the top. There is also a large tract of fine grazing land north from Glencaird to the march of Ayrshire, in the parish of Minnigaff.

The geological formation of the greater part of the moorland in Kirkcudbright is the Lower Silurian, consisting of the grey-wacke rocks, which in many places occupy the surface to the exclusion of even the heather; large boulders also being strewed plentifully over the high ground. Extensive tracts of the primary rocks also occur, occupying about one-sixth part of the whole county. The most northerly group, which embraces the Merrick range of hills, commences at the head of Loch Doon, on the Ayrshire boundary, and reaches in a southerly direction beyond Loch Dee. The middle group reaches from the river Ken, in a south-westerly direction, to Wigtown Bay. The third and most easterly group includes the Criffel range, commencing near the river Nith, in the parish of New Abbey, running in a south-west direction across the parishes of Kirkgunzeon, Urr, and Colvend, down to the sea shore. These granitic ranges are for the most part very barren, partly on account of the surface being half occupied either by the rocks or by boulders; but even where herbage appears, there is a something in connection with the formation that prevents sheep from thriving as the appearance of the pasture gives promise.

The moorland part of Wigtownshire lies entirely on the Lower Silurian formation, no granite rocks being found in any part of it. It is for the most part comparatively level, but scarcely of a less barren character than the Kirkcudbright mountains. Extensive mosses of worthless flow occupy the hollows for miles at a stretch, terminating generally in dreary morasses, often fatal to the animals that seek sustenance on their treacherous surface. Professor Geikie, writing on this subject, says—"Between the foot of the Merrick range and the Bay of Luce the ground is one wild expanse of moor, roughened with thousands of heaps of glacial detritus, and dotted with scores of lakes enclosed among these rubbish mounds."\*

There are two systems of sheep farming carried on, the one is where what is called "a ewe stock" is kept; the other, where a "running stock" is kept. Under the former system, the top wedder and second ewe lambs are sold each year in the end of summer. Under the latter, the wether lambs are all kept and

\* Lapwing.

\* Scenery of Scotland, p. 261.

disposed of at three years old, and in a few instances at two years old, the top ewe lambs being kept to fill up the place of the draft ewes; the small lambs of both sorts are, however, sold. A "ewe stock" requires finer and earlier land than "a running stock," and where the land is suitable, will pay more by 30s a score than the "running stock."

The entry to the hill farms is generally at Whitsunday. The outgoing tenant is bound to sell the whole of the sheep stock to the incoming tenant at valuation by two men mutually chosen, who, if necessary, appoint an oversman. In a ewe stock there are, ewes and lambs—eild ewes, ewe hoggs, and the shots of each lot. In a running stock there are, ewes and lambs—eild ewes, three-year-old wethers, dinmonts or two-shear sheep, ewe and wether hoggs, with the shots of each lot. On the day of delivery these are valued separately, and handed over to the incoming tenant, many of the neighbours and strangers gathering in to hear the prices of the different lots.

The time for castration and marking in a running stock is from the 25th of May to the 1st of June; for a ewe stock, about the 20th June, when the eild sheep are likewise clipped. The reason for this difference in the time of castration is in order that the lambs may get strong in the horn, which improves their appearance for selling.

Running stocks are generally all clipped at one time, about the 8th of July; the mule portion of the ewe stocks about the middle of the month. As it is of importance to get clipping finished as soon as possible on the individual farms, the neighbours generally gather in to assist each other in this operation, ten or twelve sometimes mustering at one time. An active hand can clip five or six scores a day. In entering a hill farm, the wool is the first thing that can be disposed of; fairs for the sale of it are held at Newton Stewart in the end of June, and at Dalry, Gatehouse, and Sanquhar on subsequent weeks in July. The wool of a running stock brings a higher price than that of a ewe stock, the difference being probably 1s. per stone of 24 lbs.

The lambs are taken off the ewes about the 25th of August, when, in a ewe stock, the wether lambs and the second ewe lambs are all parted with, and in a few days, when weaned, the top ewe lambs are put to the hill to be harvested. These are never disposed of, but are reserved to keep up the breeding stock on the farm. In a running stock the small lambs of both sorts are disposed of, and the tops treated in a similar manner.

The three-years-old wethers in the running stocks are ready for selling by the middle of September. They are sent by rail and steamer to the Edinburgh, Glasgow, and Liverpool markets; some lots going in the Belfast direction. The best class of these

wethers, with present prices (1873), realises from 45s. to 52s. each. The eild ewes are sold about the end of September, the draft ewes in October.

Five and twenty years ago it was the general custom to smear all the sheep intended to be wintered on the hill. This practice is now quite out of use. It is found that the sheep are much lighter for climbing their rocky paths without the weight of butter and tar in their fleeces they had to carry when they were smeared; and besides, the weight of these hanging in the wool caused the fleece to open on the back, thereby exposing the animal to the rigours of the mountain climate. Smearing also reduced the condition of the sheep, and had a tendency to loosen the wool; it failed also to protect the sheep against scab. Dipping has now universally taken the place of smearing.

A few rams are bought in on each farm every year. These are generally purchased in lambs from the breeders, the most suitable selected out of them, after keeping them eight or ten months, and the remainder disposed of. In winter they require a few turnips, or a little cake and oats, as it is difficult to obtain grass good enough to suit them. They are put to the ewes from the 12th to the 22d of November.

The hoggs or young sheep are all wintered on the low lands, and should be sent down about the middle of October. On some high stormy land the whole of the stock has to be taken away for a time. The cost of wintering, from October to April, is from 6s. to 8s. a head. This wintering is becoming more difficult to be had every year; it is obtained chiefly on the lower parts of Kirkcowan and Ayrshire. The ewe hoggs are generally wintered on grass, and the wether hoggs on turnips, wherever they can be got.

The first bite the sheep get on the uplands in the spring is the "moss crops" or "draw bent." These, as the name indicates, grow on the soft and mossy grounds, and they afford an excellent and welcome change from the dry heather of the hard pasture land on which the old sheep have been feeding all winter.

By the middle of April the lambing season comes on. This is always an anxious and busy time for the hill shepherd; and it requires all his energy, skill, and forethought to be put forth for the preservation of the weak lambs. Indeed, it is upon these qualities in the shepherd, or the want of them, as well as the kind of weather at the time of lambing, that a good or bad crop of lambs depends.

The diseases to which the mountain sheep are subject are numerous, and some of them very fatal, of which "braxy," or inflammation of the bowels, is the most deadly. Some localities are more liable to it than others; but whether this arises from

the position of these farms, or the pasture upon them, has never been very satisfactorily answered. On a farm in Kirkcudbright in one year there died, out of a stock of 800 hogs, about 400, or one-half of the whole. This, of course, is an exceptional case; but the general rate of mortality among hill stock is high, say from 10 to 15 per cent. Various theories have been advanced to account for such excessive mortality as the case cited. Some blame the pasture, some the particular exposure of the land, while others affirm that sheep do not thrive when cattle are depastured among them; the supposition is that the droppings from the cattle cause a fresh growth early in the spring, which, being too succulent for the hungry sheep, causes inflammation in the bowels. "Sturdy" is another very prevalent disease, but it is sometimes cured under skilful treatment. "Trembling" is also a fatal disease, but it is said to be principally confined to warm, dry, east-lying land. If sheep are brought from cold, north-lying land, they are in danger of dying out, unless speedily removed. "Vincus," or "vinquish"—probably a corruption of vanquish—is a wasting away, accompanied with water in the stomach. This disease is chiefly confined to the granite land, and is readily cured, when observed in time, by an entire change of pasture. The "cretuch" is an affection of the joints, whereby the sheep loses the power of its limbs. Those affected by this disease are found on the tops of the hills, the poor feeding and constant exposure there being the supposed cause of it. A change to the lower and better pasture generally effects a cure, but the sheep affected require to be watched, as they have a singular tendency to return to the old feeding ground on the top of the hill.

### 17. *Dairies and Dairy Management.*

The introduction of dairy or Ayrshire stock into Galloway dates back more than sixty-five years ago. Writing in 1810, the Rev. Mr Smith of Borgue states that several dairies on a large scale, besides some smaller ones, had been established in Wigtownshire by farmers from Ayrshire; and the same writer gives an instance of a dairy of 60 cows in the Rhinns district in 1808. From that date the Ayrshire cows have been coming gradually into favour in Galloway, taking the place of the native breed, which they threaten sooner or later to thrust out entirely.

Owing to the high price of beef, a reaction has set in in favour of rearing a portion of young stock, combining cheese-making with the production of beef. As the dairy system has hitherto been carried on, it is eminently destructive of stock, the calves, with the exception of those kept for breeders, being all sold for the shambles as soon as dropped; the price obtained is about 7s. 6d. a head. From this circumstance little attention has been



paid to the selection of the bulls, and generally the choice runs in the direction of using the smallest sires, with the view of giving greater ease to the cow in gestation and parturition. Of course, where the calves are reared on the farm for the purpose of keeping up the stock, great care is bestowed on the selection of the bull, as well as on the pedigree and appearance of the mother. A few calves are reared for this purpose in most dairies, though the great bulk of the young stock is imported from the higher districts of Ayrshire, where the farmers lay themselves out for the rearing of dairy queys.

The dairy system having commenced so early in the present century in the Rhinns district of Wigtownshire, that locality seems to have taken and kept the lead, not only as to the number of its dairies, but also as to their size; for, with the exception of a few farms, the whole of this peninsula is at present under the cheese-making system. During the last five and twenty years great changes have likewise taken place in the Machars or lower district; large dairies having been introduced on farms where the Galloway stock were formerly bred and fattened.

In Kirkcudbright the dairy system has increased to a considerable extent among the farms on the lower grounds; though, from the high price of sheep stock, it is not likely to extend in the meantime to the higher grassy lands, as has been the case of late years in Dumfriesshire.

The size of the dairies varies from 40 to 100 cows. There may be a few which contain a smaller number than the former figure; but it is generally considered cheese can be produced more economically in a dairy of this size than with a less number of cows. On the other hand, when the number much exceeds 100, it is found inconvenient, with the private appliances on the farm, for the manufacture of cheese. There are as yet no public dairies.

Formerly, it was the almost universal custom to let the cows to a bower, but latterly this arrangement has been in many cases departed from, preference being given to the system of employing a responsible dairyman, or dairymaid, to look after the cheese-making, and everything in connection with the dairy. In following out this plan the owner can exercise more freedom in the feeding of the cows, and can vary the quantity as well as the kind of feeding according to circumstances, more readily than when under a contract with a bower to supply a certain kind of food of a given quality and quantity. When the cows are let, a written agreement is drawn out specifying the number of stones of cheese the bower is to give for each cow or quey, and also the amount of feeding the cows are to receive in the winter and spring, stating also the time they are to be turned out to grass,

and the number of acres of pasture allowed to them. To avoid misunderstanding, it is necessary to be minute and explicit in detailing all the different items of the contract, so that nothing may occur to mar the harmony and good feeling so desirable for the successful conducting of the dairy.

When the cows are not let, but given into the charge of a dairyman, it is found advisable for his encouragement, besides payment of his usual wages, to enter into an agreement with him something like the following:—Dairyman to take charge of the cows, and, if they produce above 20 stones of cheese, of 24 lbs. to each cow, and 16 stones to each quey, he shall receive one half of all above these quantities up to the value of L.60.

The term of entry is always at Martinmas, and, when the dairy is let, it is for one year, a fresh engagement being necessary every season. The first care at the commencement of the dairy year is to have the cows properly wintered; as upon the careful feeding of them while in the house depends in a great measure their milking powers during the ensuing summer.

The amount of feeding given during winter varies on different farms; but the following may be taken as general examples of the winter treatment cows receive, and the allowance of extra food given to each. Two tons of yellow turnips given before Martinmas, to keep up the winter milk; or, where cabbages are grown, they are sometimes substituted; and 5 tons of Swedes or yellows afterwards, with 2 or 3 bushels of beans ground, after calving. In winter the cows get straw at half-past five in the morning, turnips at eight, and straw again after they have eaten the turnips. They are put out for two hours during the day, and when they come in they get turnips, then straw, and finally straw at eight at night.\* The straw is supplied to them in small quantities at a time, and never allowed to accumulate in the racks before them. On some farms a certain number of acres of turnips are allowed, say—1 Scots acre to six cows—the dairyman lifting them and taking his chance of the crop.

On Baldoon Mains and Crook, where few turnips are grown on the clay soils, draff, obtained from the neighbouring distillery at Bladnoch, is used as a substitute, and is found to answer the purpose well, about half a bushel a day being allowed to each cow. A good meadow is a valuable addition to a dairy farm. It supplies excellent winter feeding for cows. With good meadow hay cows winter well with few turnips; and in spring it is unsurpassed for milk-producing properties. Dairymen prefer to have the cows to calve early, say in February. This involves long feeding with artificial food; but, no doubt, the bower is

\* On many farms the cows are not allowed to go out during winter after Martinmas, but have water supplied to them in the house.

anxious to get as much as he can from the cows before the following Martinmas. The cows are generally allowed to go dry about November, or three months before calving, late milking being supposed to induce abortion. The dairy stock is not turned out until the grass is well up, which is from the 1st of May to the 16th of the month, according to the season: an acre and a quarter being allowed to each cow. As soon as the early sown fitches or clover are ready for cutting, which is in June, the cows get a feed night and morning during the time of milking; two acres of the former and two of the latter being sufficient for this purpose, when irrigated with liquid manure, for a dairy of 90 cows during the season.

Having thus brought the dairy stock to the grass when the cows are in full milk, and the work of the dairy is in operation, we shall now look into the mysteries of cheese making. There are two kinds of cheeses made—the Cheddar and the Dunlop.\* The Cheddar is so called after a village in Somersetshire, where the celebrated cheeses of that name were originally produced. The soil of the Cheddar district rests on the limestone, upon which always grows rich and sweet herbage; and it is to this circumstance, perhaps, as much as to the care bestowed on their making, that the native cheeses owe so much of their excellence. Considerable diversity of opinion prevails among Galloway dairymen as to the effect of different qualities of soil on the production of cheese. Some affirm that cheese produced on good soil should not be of a better quality than that produced on soils of an inferior description. Others again argue that it is the soil that gives character to the cheese, the management in both cases being equal. In Wigtonshire a good deal of emulation prevails between the Rhinns and Machars dairymen. A large share of the prizes at the chief cheese shows having fallen to the lower district, the Rhinns dairymen are naturally looking to their laurels: but, notwithstanding much care and inquiry among them, Mr Gardner at Baldoon, when he competes, generally stands first. The fine pastures on this farm, it is averred, contribute in no small degree to Mr Gardner's success, while he, on the other hand, does not attach so much importance to the richness of the pasture in seeking for first quality of cheese, as to the careful manipulation and management during the process of making. Without asserting a strong opinion on this subject, we shall only remark, that wheat, grown on the same farm, is ascertained to produce more loaves to the quarter than wheat of the same weight per bushel, and to appearance as good, grown on inferior soils in the same county. Reasoning from this, we would be disposed to attribute the superiority of the Baldoon

\* As the Dunlop system is little practised, except in some small dairies, we have confined our remarks to the manufacture of the Cheddar cheese.

cheese, in part at least, to the soil, but, without careful management and observation, this excellence could not be obtained.

The success of the dairy depends in no small measure on the completeness of the buildings and utensils required for carrying on the operation of cheese making, and great improvements have been made within the last few years, chiefly by the introduction of steam in the process of manufacture, and for heating the different rooms in the dairy. The buildings of a well-arranged dairy recently erected in the upper district of Wigtownshire are as follows:—First, the apartment for keeping the milk at night, and for steeping, 20 feet by 17 feet; second, the press house, 20 feet by 12 feet; third, the cheese room (on the ground floor), 28 feet by 21 feet; height of ceilings, 10 feet.\* All the apartments are well ventilated from the roof and sides to keep down the temperature in hot weather. Fourth, the heating apparatus; this consists of a boiler, 8 feet long by  $2\frac{1}{2}$  feet in diameter, connected by pipes with the steeping tub, to supply steam for raising the temperature in process of cheese making. The several apartments are fitted up with 3-inch metal pipes, into which steam is introduced from the boiler to keep up the temperature in cold weather. The steam from this boiler also heats the water used in washing the dairy utensils, cooking food for the pigs, horses, and cows in spring.

The dairy utensils comprise steeping-tub of tin with false bottom for heating the milk; fire-clay milk coolers; cheesits, of which nine are required,  $14\frac{1}{2}$  inches wide by 14 deep, holding 80 lbs. of green curd; two double presses, and one single one; two curd coolers, with grating of wood in the bottom covered with canvass, so as to allow the whey to escape from the curd; breaking-shovels; curd breaker; pails, &c.

There are, however, many of the chief dairies, without appliances for raising the temperature by steam, in which the curd and milk are heated in the usual old fashioned way. It is understood that greater care is requisite in heating the milk or curd by steam being introduced underneath, than in the usual method by warmed milk or whey. Mr Gardner still adheres to the old way as being safer. He considers it better to have his cheese room up stairs, as being more airy, and calculated to mature the cheese sooner than when on the ground floor. He objects also to the cheese room being heated with steam-pipes, as they cause a moisture in the apartment unfavourable to the

\* The position of the cheese room on the ground floor may be objected to, but Mr M'Master, Culhorn Mains, whose dairy we are describing, considers it rather an advantage than otherwise, inasmuch as it insures a lower temperature in summer, and the winter temperature can be easily regulated by the heating apparatus. The saving of labour in the carrying of the cheeses up stairs is also considerable.

ripening of the cheese. An open fire-place at one end of the room, and a close stove at the other, is all that is necessary for heating purposes.

In making Cheddar cheese slight diversity exists among the different dairies as to the carrying out of the practical details, but as we cannot enter into many of these minutiae, the details of one or two of the methods most generally practised are here given.

At the Baldeon dairy, Mr Gardner puts the warm morning's milk into the steeping-tub first, then adds the previous evening's milk, which has been all night in the coolers. By doing so he considers that the temperature of the milk can be brought to a more uniform degree than when the warm milk is added to the cold. The milk thus mixed is then heated up to 80°, by means of hot whey which has been previously soured. When the temperature of the milk is 70° little sour whey is required; at 60°, 12 choppins or English quarts are needed to sour 90 gallons. It is this souring process that gives character to the Cheddar cheese, and to the careful management of which a good deal of the perfection of the cheese belongs. If too much acid is present in the curd it imparts to it a bitter taste, and if too little the curd is tasteless, and does not possess that delicate flavour so indispensable to good Cheddar cheese. By being properly soured the cheese also becomes earlier ripe and sooner marketable. The proper degree of sourness is ascertained, when draining off the whey, by the last few canfuls only showing the presence of acid, and, if there is reason to suspect that acid is present in excess, the curd is washed with fresh whey, until the superfluous acid disappears. So much for the souring process.

When the milk in the steeping-tub has been heated by the sour whey to 80° the steep and colouring are added, and carefully stirred until the whole is properly mixed. As much steep is used as will produce curd in forty-five minutes. If the milk stands unsteeped longer than that, the cream begins to rise, and goes off in the whey, whereby the quality of the cheese is deteriorated. Breaking then commences, and is continued for half an hour, when a little whey is taken off the top, and heated in the warmer to 140°. This is used to raise the temperature of the curd in the tub to 83°. This occupies a quarter of an hour, during which breaking is continued, and for a quarter of an hour afterwards, so that the whole time occupied by breaking is one hour. The contents of the tub are then allowed to remain at rest for half an hour covered up, when the whey is taken off to within three inches of the top of the curd. Part of the whey is put into the warmer, and heated to 160°. This is used to raise the temperature of the curd to 100°. It takes half an hour to heat, and during that time the curd in the tub is constantly

stirred. The warmer is again filled with cold whey, which is heated to  $160^{\circ}$ , with which the temperature of the curd in the tub is raised to  $102^{\circ}$ . It is then stirred for half an hour, and afterwards covered up for half an hour. The whey is then run off, and the last few canfuls kept for souring the milk in the steeping-tub in the morning. The curd is then put into the centre of the bottom of the tub to drain, and covered with hot cloths, in which state it remains for half an hour. The cloths are then taken off, and the curd cut in four pieces; these are placed one above the other, and in this way it remains for half an hour covered up with hot cloths. It is afterwards lifted to the cooler, where it lies for half an hour, turned, and left to cool another half hour. It is then milled and salted at the usual rate of 1 lb. of salt to 56 lbs. of curd. It is then put into the vats, which are placed in the press. It is by this time about three P.M., and a gentle pressure is put on until seven, when the hot cloths are supplied, and the cheese returned to the press. The pressure is increased until next morning, when the cloths are changed, and full pressure put on; the cloths are again changed at night. The cheese, after remaining in the press for twenty-four hours, are taken out, capped, and put back to the press for twenty-four hours. They are then taken out, bandaged, and sent to the cheese room. The caps remain four weeks on. The cheeses are ripe in three or four months.

At the dairy of West Mains of Baldoon, where cheese of an excellent character is made, the following are the chief points in the management:—Twenty gallons of milk are put into the steeping-tub at night, to which is added next day, first, the morning's milk, and then the remainder of the milk of the previous evening. The thermometer stands at  $80^{\circ}$  when the steep and colouring are put in, and curd is formed fit for breaking in an hour. The temperature of the milk in the steeping-tub is raised by warmed milk, there being no appliances for heating with steam. The breaking occupies about forty minutes; but, before this is completed, warm whey is added to keep up the temperature to  $80^{\circ}$ . The curd is then allowed to settle for half an hour, when some whey is put into the heater for the second heating, and the remainder let off until the curd is visible. The curd is next broken and stirred up, and the temperature raised to  $90^{\circ}$ , when it is allowed to settle again for half an hour, after which the whey that remains is drawn off, and the curd heated to  $100^{\circ}$ . It is now left to settle for a quarter of an hour, when the curd is gathered into the centre of the bottom of the tub, where it remains for half an hour to allow the whey to drain off. It is then put into the vats, and under pressure for a few minutes, according to the acidity, and when taken out of the presses, is weighed and spread on the coolers for half an hour before

milling. After being milled, the curd is salted, and put into the chesits and press; full pressure is put on at once. The dairy-maid here considers that, if the curd is rightly made, no butter will show by the full pressure being put on at first. On the second day hot whey is put over the cheeses, the cloths changed, and the pressure continued. Next day they are taken out of the vats, and bandaged and put on the shelf of the cheese room. They are ripe in three months.

The Canadian system has been introduced into Wigtownshire, and is practised in a modified way with more or less success in several dairies. As the working of it is somewhat different from either of the methods described, the details are here given in full, as carried out by Mr McMaster, Culhorn Mains.

The evening's milk on being taken from the cows is put into coolers until the morning, when it is drawn off into the steeping-tub. The temperature of the evening's milk is kept about 66°, so that little heated sour whey is required to raise it to 83°, when the morning's milk is added, at which point the milk should stand when it receives the rennet and colouring. As much rennet is put into the milk as will produce curd in about sixty minutes fit for breaking. Care is taken to break the curd gently at first, and the process is continued for thirty or forty minutes, until the curd is firm, and in a proper state for the separation of the whey. The mass is then allowed to settle for about thirty minutes, when it is stirred up, and the steam applied gently at first, and then gradually raised during thirty or forty minutes to 97° in summer, and 2° more in spring and winter. The stirring is continued for forty-five minutes, or until the curd comes to the proper firmness, which is ascertained by the curd feeling elastic, opening up, and dividing freely on being squeezed in the hand. The curd is then allowed to settle down for about thirty minutes, stirring occasionally to keep it from getting into a solid state. The whey is then drawn off in the usual way, until the curd appears, so that when acidity is approaching, the whey can be more quickly taken away; this is done as soon as the acidity makes its appearance. This is a very important stage in the operation of cheese making, and great care is needful to secure the right degree of acidity; if too sour the cheese becomes dry, and if too sweet softness and holes are produced. In the souring process the degree can be ascertained at an early stage of the operation, and when not sufficiently advanced the making process can be lengthened, and, on the contrary, hastened when the acidity is too forward. After the whey has been drawn off the curd is lifted out of the tub, and put into the cooler, and constantly stirred up for twenty minutes to keep it in a divided state; after which it is stirred occasionally until the proper acidity is acquired, and to allow

the remaining whey to escape. The curd is then weighed, and salted at the usual rate. It is then allowed to cool down to 68° or 70°, when it is put into the vats or cheesits, which are immediately placed in the press. By this time it is between four and five o'clock in the afternoon. A gentle pressure is put on at first, which is gradually increased, until ten P.M., when full pressure is continued during the night. Next morning the cheeses are taken out of the vats, and immersed in scalding water for about three minutes for the purpose of giving them a good skin, and preventing them from cracking. Dry clothes being supplied, they are replaced in the press until the following morning, when the cloths are taken off, and the cheeses put into dry vats previously heated, without any cloths, and again placed in the press, where they remain until next morning. They are then bandaged and carried to the cheese-room, where they are turned regularly once a day. With a well-aired and well-ventilated cheese-room, and the temperature kept steady at 60° to 65°, they will be ripe for market in three months.

In making cheese by this method in Canada, it is calculated that it takes from 9½ lbs. to 10¾ lbs. of milk to make 1 lb. of cheese, which is somewhat near the quantity required in this country. The expense of making is 1 dol. 10 c. per 100 lbs., boxes included, or about 5s. of our money. This is considerably under the cost of production in this country, for if we take the working expenses of the dairy at 30s. per cow, and her produce at 480 lbs. of cheese, this gives 6s. 3d. as the cost of making 100 lbs.

A great drawback to the success of the dairy is the number of cows that every year lose their calves from abortion, or that require to be replaced through defective vessels, age, or other causes. On a moderate calculation, this number is about 14 per cent., of which 8 per cent. is from abortion alone. This disease is frequently the cause of a great deal of disappointment and loss in some dairies, while in others it seldom appears except in isolated cases. The cause of it has not been very satisfactorily explained; and, for prevention, it is curious to note, that the course adopted by some dairymen is exactly that which others think is the producing cause. For example, it is a common opinion in some places that allowing the cows to go out for an hour or two about midday in winter is apt to induce this disease; whilst other practical men, who do not in general allow the cows to leave their byres in winter, recommend them to be put out for two hours every day as a preventive if abortion shows itself in any of the cows. It is hardly within the province of this report to enter into an elaborate discussion as to the causes of this disease. At the same time it is worthy of remark, that Galloway cows are seldom known to lose their calves; and they, as a rule, are a great part of the winter's day in the open air.



Regular feeding, with clean and wholesome diet, when confined to the byre, goes a great way to prevent abortion, care being taken at all times to have the turnips well cleaned and free from frost when given to the cows.

Pig feeding is an important branch of dairy management. When the whey leaves the steeping-tub, it is conveyed by an underground pipe to a tank or reservoir situated as near as possible to the pig-houses. These houses are generally built expressly for the purpose, and are constructed on different principles in different dairies; in one place the pigs are not allowed to see daylight from the time they are put in until ready for the market; while at another, each house is furnished with a small open court, in which the feeding troughs are placed. This latter plan seemingly recommends itself to reason as the more advantageous of the two. By feeding outside the bed is kept dry, and the animals thrive and grow the better of having a little room to move about, while under close confinement their legs are apt to become bent and deformed. Whey alone is seldom used to feed pigs; it may keep the young stock in a thriving state for a certain time, but some more solid substances are used to complete the growth of the hogs and bring them to maturity. Indian corn, ground and boiled, or steeped in hot water overnight, is a common adjunct, and of this 1 to 3 lbs. to each pig is allowed daily. With careful selection of the breed to be fed, and minute attention to cleanliness and proper diet, pigs at six months old can be fed to weigh 15 imperial stones.

It is understood by dairymen that the pigs, after deducting the cost of all extra food, leave as much clear profit as will pay for the working expenses of the dairy, which amounts to about 30s. per cow.

There were 9659 pigs in Kirkcudbright in 1871, being an increase since 1857 of 2456. In Wigtownshire the numbers in 1871 were 11,352, being an increase of 1079 since 1866.

The exportations from Galloway by rail and sea, during the year ending 30th June 1873, amounted to 13,048.

### 18. *Permanent Pasture and Meadow Land.*

The permanent pasture, exclusive of meadow land, from which a crop of hay is taken, occupies an important place in the agriculture of the two counties. The Board of Trade returns for 1871 show that there were in Kirkcudbright 58,260 acres, and in Wigtown 27,913 acres, not broken up in rotation, but devoted solely to pasturage; being for the former more than three times the number of acres there are under green crops, and for the latter fully double the number of acres there are under the same crops.

The stock on this description of land is for the most part

of a miscellaneous kind, consisting of cattle, dairy cows, and sheep; the best parts of it, however, are generally reserved for feeding cattle for the fat market. The cattle for this purpose are purchased in October, and are selected from the best stocks that can be had: aged bullocks are preferred. They are wintered on the old grass, with or without fodder according to the season; but, in general, they are allowed what they can eat, the fodder being placed either in cribs or laid on the open fields. For some weeks in spring they are supplied with about half a cwt. of turnips each daily, so that when grass appears they are in good condition. A full stock for "summering" not being kept on the fields during winter, the numbers are increased as the grass becomes more plentiful, the same quality of cattle being selected. If the cattle have wintered well, and have been supplied with oil-cake, they are ready for the market by July or August, though on some pastures they may be matured earlier. Cake is not uniformly given in summer; by some it is questioned whether the profit repays the expense, but as a rule, except where the pasture is very luxuriant, it is allowed for some weeks previous to the sale of the cattle.

•In illustration of the system of fattening cattle on the old grass, a short sketch of the management pursued at the parks of Howell, in the parish of Kircudbright, may be interesting. These pastures consist of about 386 acres, and comprise the "Milton parks," which are considered the best grazing land in the south of Scotland, and were formerly old Church property in connection with the adjoining Abbey of Dundrennan. Mr Lusk says—"A part of the old grass is allowed for dairy cows, sheep, and horses; but about 250 acres of the best of it are kept for fattening cattle, mostly 3½-years' old Galloways, which from the middle of November have sole possession of the fields until about the middle of May, when we add to their numbers, as grass comes, the best old cattle I can get, till we have usually over 200 on them by the middle of June. The store cattle are all 'outlying.' Besides what hay they can eat, carted out to them daily, and laid on the open fields, they are allowed, for about ten weeks in spring, 56 lbs. of turnips each, so that when grass comes they are in good condition. I begin to sell them off fat about the middle of June, getting through them in September. For a number of years I gave an allowance of oil-cake in some of the fields; but, as a rule, I found this did not pay, and have now quite given it up. I prefer Galloways to any other breed of cattle; they seem most at home on our pastures, and, though costing more to begin with, where they are known, fleshers are so partial to the 'Scots' that with me at least they give the best returns."

On the same farm there are about 60 acres of meadow, from

which heavy crops of hay are cut, on which the dairy cows and black cattle are wintered. About one-fourth part of these meadows are irrigated with mill water, into which all the washings from byres, cattle-sheds, and dung-heaps are led. The unirrigated part is top-dressed every third year—about one third annually—with compost, or well-prepared farm-yard manure, at the rate of forty loads the acre. As the grass is apt to get lodged, it is cut early with mowing machines, and carted into the hay-barn without being put into “stamp coles.”

Considerable changes have taken place lately in different localities regarding the meadows from which a crop of hay is taken. In some places they have been turned into sheep-walks, while in other places they have been extended, and have always proved a valuable addition to the winter food of dairy cows, enabling the farmer to dispense with breaking up so much of the pastoral land for fodder during winter.

A good portion of the hay is cut on the banks of the rivers, which are apt to get flooded while the ricks are standing on the meadow. No time requires to be lost in the hay season in getting the crop out of the reach of these inundations, and the cart has to be employed frequently to place the “coles” on an eminence beyond the reach of the water-mark.

On the whole, the acreage under natural hay has increased in Wigtown from 3152 acres in 1870 to 3335 acres in 1872, while in Kirkcudbright it has increased from 8741 acres to 9463 acres in the same years.

The usual mode of improving the old grass and meadow lands is by lime, or bone manure. When the former is used, it is applied at the rate of five tons an acre, care being taken to have it well in powder at the time of application. When too wet, it cannot be got properly spread, and it loses a great part of its virtue. Half-inch bone manure is a valuable fertiliser for grass land, and when applied at the rate of from half a ton to a ton an acre the effects are not only speedily visible but lasting.

#### 19. *The Farm Labourers and their Cottages.*

The married ploughmen are, for the most part, accommodated with cottages on the farm; any young lads that may be required are kept in the farmer's kitchen. There are no bothies in Galloway. The engagements of the cottagers are for one year, generally from 26th of May; six months notice of removal is given. The hours of the men in summer are from six in the morning till twelve, when two hours are taken for dinner and rest; they resume at two afternoon, and stop at six. In winter, when the horses are in the stable, the men come to feed and clean them at half-past five in the morning, yoke at half-past seven, and plough eight hours, unyoking for feeding at twelve. The

men again attend the horses at eight in the evening to supper them and rub them down.

Five and twenty years ago it was the custom on most farms to thrash the crop with the men by candlelight in the morning, who were also engaged in winnowing grain in the barn two nights in the week.\* This is almost entirely abandoned now, except in isolated cases, a regular staff of barn workers being appointed on all well-regulated farms.

On dairy farms each of the men is bound to furnish a milker, who also by agreement is to be kept employed in farm work when it is to be had. This part of the bargain is not in general acceptance among the ploughman, and the masters affirm they can get only men of a secondary class to agree to it.

The wages have hitherto been paid partly in kind and partly in money, but there is a growing desire both among employer and employed for money payments entirely, which, on many farms, have been adopted. Payments in kind are called "benefits," the items of which vary in the several districts of the two counties. It is a curious fact that they are highest in value on the best farmed land, or on the land in the vicinity of the sea-shore, which, no doubt, has the effect of attracting a better class of men to those districts. "Benefits" and money wages have been advanced considerably during the last three years; the following may be taken as the higher rate, while on many farms it is from 10 to 12 per cent. lower. The farm produce is here calculated at the average price of the last three years, the coals at present (1873) rates:—

7½	bolls, or 150 stones of oatmeal, at 2s., . . .	L.15	0	0
6	bushels of barley, at 4s. 6d., . . .	1	7	0
3	bushels potatoes, planted, . . .	1	10	0
3	tons (24 cwt. each) of coals, carted free, . . .	5	2	0
	House and garden, with manure, . . .	3	0	0
	Money, . . .	15	0	0
	Allowance in harvest, . . .	1	0	0
	Leave to keep a pig, hens, &c.			
		<hr/> L.41 19 0		

When money wages are given they amount to nearly the same sum.

The wages of lads, or young ploughmen living in their masters' houses, are from L.12 to L.13 in the half year. As these young men are to form the ploughmen of the future, we may very shortly allude to their position and prospects. Living apart from the evil influence of the bothy, they are in general sober, steady, and free from vice. Having a good deal of time

\* The winnowing of grain in the winter evenings by the farm servants was first introduced into Galloway more than a century ago by William Craik of Arbigland.

at their disposal in the long winter evenings, ample opportunity is afforded them for self-improvement, which, we are afraid, is only in rare cases taken advantage of. A very few manage to save out of their earnings, so that when they marry, which is generally early, there is little to commence housekeeping on. Feeling deeply, as all who reflect on this subject must feel, we will be excused a word of regret that the ways of applying their spare time to useful purposes, and forming habits of thrift and saving, have not been adopted by our young working men. This is the more to be regretted, when we see how much personal comfort is secured to the working man by the possession of a few pounds at the outset of his married life; and we feel compelled strongly to urge upon all these young men the necessity of acquiring early habits of saving, which, with determined effort have before now enabled, and are still enabling, men of this class to rise to situations of trust.

The rise in the wages of the married men within the last five years, taking the foregoing as the basis of calculation, may be estimated at one-fourth, or 25 per cent.; and no one acquainted with the general steady character of the men, will for a moment grudge them the advance. As a class they have hitherto been underpaid, and it is to be feared that their position at present would compare unfavourably with that occupied by the same class five and twenty or thirty years ago. At that time the cottars on most of the farms were each in possession of a cow, for the keeping of which L.4, 10s. was deducted from his wages; the calf also was allowed to run on the farm until the following spring, when it was purchased by the master for L.4 or L.5. For the small amount of the purchase money at that time, the cottagers had the means within themselves of furnishing their families with milk and butter; but at present very few of them could afford to purchase a cow for this purpose.

The cottage accommodation has hitherto, in many places, been defective, both as to extent and in interior arrangements for comfort. A movement was made some years ago to pull down unsightly cottages without providing any better accommodation. The effect of this was to drive the working population to the villages and towns, from which the labourer had to walk long distances to and from his work. Now, however, a reaction has set in in favour of extending the cottage accommodation, especially in the Rhinns district of Wigtownshire, where it had always been most defective. The Earl of Stair is showing a good example in this respect, having, since the beginning of 1872, erected no fewer than twenty-eight cottages on his estate in the Rhinns, and about fourteen more are in process of erection. These cottages have been erected either by agreement with the tenant at the beginning of a lease, or by the tenant agreeing to pay 5 per cent. on

the outlay; and T. Greig, Esq., the factor on the property, affirms that the tenants are glad to get the cottages built on paying the interest, so much is the want of houses felt in that district. On the estate of Carrick Moore, Esq., of Corsewell, five double cottages have been erected during the last two or three years, without any interest being charged to the tenants. Some of the old cottages which were pulled down were built of dry stone, covered outside and inside with clay, and all with one apartment, the floor of which was formed with till. They were generally in a tumble-down state, being propped up with wooden posts, which, in some cases, protruded into the interior of the building.

We give the cost and dimensions of the apartments of some of these new cottages. One, erected in 1873 on Lord Stair's property, consisted of two rooms, 12 feet 6 inches by 13 feet 6 inches, and 10 feet 10 inches by 13 feet 6 inches respectively; height of ceiling 9 feet 6 inches. It was built of bricks, and cost L.70, 5s. A double cottage for two families, with three apartments in each, cost L.158. The cottages on the Corsewell estate were built after a design of D. Guthrie, Esq., the factor there. They are double houses for two families, consisting of three apartment, of the following dimensions:—Kitchen, 15 feet 6 inches by 15 feet 2 inches; bed-room, 10 feet by 6 feet 4 inches; bed-closet, 7 feet by 6 feet 4 inches—height of ceiling, 8 feet 6 inches. Built with projecting windows, each of the double cottages cost L.120, and when less ornamental, L.96.

The furniture of the old houses do not fit the new buildings; and the men complain that they have to purchase an entirely new suit at a considerable expense, which they can ill afford. This might be remedied by the landlord or tenant putting in iron bedsteads, and making a moderate charge for use of them.

The old-fashioned worker's house consists of one apartment only; any division required is made with what is called a "box-bed." In these circumstances separation of the sexes is impossible; nor is it possible to obtain that privacy for the individual members of the family so essential for their proper upbringing.

Randolph, late Earl of Galloway, bestowed a good deal of attention on the cottages on his estate in Wigtownshire, and accomplished a great reformation in that respect. Many new ones, some of them of elegant design, were erected, all containing three apartments, without any additional charge to the tenant on whose farm they were placed. A number of the old ones were likewise remodelled, improved, and subdivided. Still a good deal remains to be done in the same line; and now that the call is for better houses, it is hoped it will be heartily responded to on all sides.

*20. The Farm Buildings.*

A modern well-appointed farm-steading is very different from the buildings required on the farm fifty years ago. At that time the only houses in use for the cattle were long empty sheds, opening into court-yards, in which the hardy Galloways were wintered. These have given place to, or have been supplemented by, substantially fitted up feeding-byres or cow-houses, and other buildings in connection with the dairy. Then the flail and horse-mill were the chief thrashing instruments which beat out the corn without separating it from the chaff. These also have been displaced by the powerful water-wheel, or the stationary steam-engine in connection with machinery, which at one operation thrashes the corn, and prepares the grain for the market. In all these advances, the tenants have borne their full share of the outlay. Did a change in the system of management necessitate the erection of a feeding-byre? In many cases it had to be done at the tenant's own expense, or on payment of heavy interest. Or, if steam had to be introduced to drive the thrashing-mill instead of horses, the whole cost of the erections in connection therewith, including the building of the costly chimney, fell upon the tenant, and without any hope of being recouped at the end of the lease. Neither does it improve matters when, at the beginning of a lease, the tenant is asked to pay  $6\frac{1}{2}$  per cent. on capital expended by the landlord in necessary farm buildings. This is the rate of interest fixed by the Lands Improvement Companies on loans advanced for the erection of farm buildings, the payment of which ceases at the expiry of twenty-five years. It seems hard for a tenant to be asked to pay this interest, when at the end of that period the buildings become the property of the landlord free of charge. These companies insist also on the best and most expensive materials being used in the construction of the buildings. Hewn stones for the corners, the best pine for the roof, and everything in a style calculated to endure for a hundred years. This extravagance has no doubt deterred many of the tenants from encountering such a high rate of interest; but if a more equitable arrangement could be made, such as dividing the interest between landlord and tenant, we might indulge in the hope of seeing, ere long, fewer ruined homesteads over the country.

A satisfactory arrangement has been recently introduced, and is being carried out under the energetic direction of J. Drew, Esq., on the Earl of Galloway's estates, which seems to work well. When the leases expire, the buildings are remodelled, or the accommodation increased where found deficient. The rents are then fixed, on the assumption that the buildings are complete.

## 21. Conclusion.

Taking a general survey of Galloway, it may be said that the progress made by agriculture in the province during the last twenty-five years has been considerable. In the soil itself great changes for the better have been wrought. Stones and rocks have been removed from the surface, or quarried from the soil; and in some localities this has been done to such an extent as to change the face of the country. Mosses and swamps have been drained, and converted into arable land, which is now bearing corn or grass in rotation with the dry portions of the fields. These improvements have been executed in numerous cases by the tenants at their own expense. Occasionally some proprietors take up a farm to improve it before leasing it; but the greater part of these changes have been wrought by the occupiers of the farms.

The increase in the valuation of the counties has been noticed previously. This increase cannot in fairness be *all* claimed as the result of the improvements effected by the tenants. But, in justice to them, it must be said that a large share of it has been produced by the progressive value of the land, consequent on their own expenditure in lime, manure, and wages. On most of the land in Galloway it is scarcely possible for an enterprising tenant to carry on farming without, to a certain extent, increasing the value of his farm at the end of a nineteen years' lease. There are also men of easy disposition who do not go in for much of this, and leave things pretty much as they found them. When the valuator comes round at the end of the lease, the enterprising man has no chance with his less pushing neighbour. For every stone or rock he has removed from the soil, for every drain he has made, for every open ditch he has covered, as well as for the extra manure he has applied during the currency of the lease, he has to pay now, in the advance of rent that is asked, owing to the improved appearance of the farm.

In justice to many landlords it must be said, there are gentlemen amongst them who consider the position of an improving tenant at the end of his lease, and are far from exacting "the pound of flesh."

A desire is beginning to manifest itself among landowners, to shorten the usual duration of leases, which has hitherto been nineteen years. It is to be feared that this is a step in the wrong direction. The present improved appearance of Wigtownshire is mainly owing to the existence of leases of nineteen or twenty-one years. On land incapable of further improvement there might be some show of reason in this movement, which is evidently for the purpose of obtaining the advance of rent at the end of twelve instead of nineteen years. But on land such as the Galloway



soils, where so much capital is still required to bring it into a high state of cultivation, it is simply a mistake. Farmers will not expend their capital freely on a farm under a twelve or a fifteen years' lease. But this restriction may act beneficially on themselves; it will make them pause in their expenditure on their farms, which have hitherto been carried on, in many instances, more as if they were the landlords than the tenants.

New and more stringent clauses are being introduced into some of the leases of the present day; the purport of which is to give directions as to the general management and manuring of the farm, and other points. With regard to the manuring clause, this part of the obligation may be deemed necessary, owing to the increased number of strangers, unacquainted with the business of farming, who now occupy farms. The old class of Galloway farmers have always been liberal in applying manure, and generally leave the land in better condition at the end of the lease than when they got it, to which the rich manure, made from highly-fed cattle, in no small degree contributes. Dairy farming, on the contrary, tends to reduce the condition of the land, and more artificial manures are needed to sustain its fertility than where cattle are fed.

During the last five and twenty years, the rent of land has advanced 58 per cent. in Wigtown, and 66 per cent. in Kirkcudbright.

The gradual rise that has taken place in agricultural produce since 1848 will, owing to the increased cost of labour, and the extra quantity of manure required to produce crops equal to those of former years, scarcely account for this. The advance in the price of grain, beef, mutton, and dairy produce, since the above date, may be stated at 33 per cent. On the other hand, the rise in men's wages since that time amounts to 50 per cent; and in women's or field workers' wages, the advance has been 70 per cent. Putting these figures together, we have—rents advanced 62 per cent., labour advanced 60 per cent., while the advance on the produce of the farm has been only 33 per cent.; wool alone excepted, the value of which has risen more than 100 per cent.

It will be inferred from these figures, that the profits of farming at present are not equal to those of former years; and still the demand for land continues, and the advance, notwithstanding the increased cost of labour, still goes on. There is, however, a limit to every thing; and the feeling generally entertained by experienced men is, that land has got beyond its value. With the lesson of 1806 before them, and its consequent train of ruin and overturn, farmers are acting cautiously in offering for land.

It is now the custom on some estates to call in the services of valuers from a distance at the end of the leases to put a rental on the farms. Without saying a word in disparagement of these

gentlemen, whose judgment at home we have no doubt is in repute concerning land with which they are acquainted, we must be allowed the remark, that no strangers, coming from the neighbourhood of cities, where ready markets are available, into a distant province such as Galloway, can have an adequate idea of the expense attending the marketing of the farm produce. These expenses amount to 12 per cent. on grain, and 6 per cent. on cattle and sheep sent to the Liverpool market, and in a valuation by a stranger are generally lost sight of.

It is the prevailing opinion of practical men in the district, that the local factors are much more likely to arrive at a proper estimate of the value of land, than an utter stranger unacquainted with its position or capabilities. Though brought up as lawyers, they are well acquainted with the agriculture of the district, and farmers would receive a valuation from them with greater confidence than from a stranger.

#### ON THE GENERAL MANAGEMENT OF PLANTATIONS.

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*[Premium—Ten Sovereigns.]*

THE woods and plantations of Great Britain are perhaps more neglected than any other department in the general management of landed property; but whether this arises from the lack or the misapplication of knowledge, it is not intended here to discuss. That such is the case, however, no one will deny, the fact being too apparent to all who take the trouble to find it out. In this paper it is only proposed to point out a few of the drawbacks pertaining to sound and good forestry, at the same time giving some suggestions on the subject, and then to give an account of the practical treatment of several plantations which have come under the writer's own management, showing the results thereof. It is much to be regretted that neither the practice, science, nor literature of arboriculture have kept pace with the sister arts of agriculture and horticulture. This may be accounted for in many ways. The landed proprietors, deriving the greatest amount of his income from agriculture, from the land under cultivation being great in extent compared with that under wood, and the great number of the population of our country interested in and dependent on farming, he very naturally wishes to forward farming by all available means in his power. He does this by becoming practical farmer himself; he takes delight in showing good examples of high and improved agriculture, attending the meetings of and assisting societies for the promotion of agriculture, while his woods are perhaps either entirely neglected or but little cared for, and his interest in their

progress is comparatively limited. He probably is anxious about the trees in his ornamental park, and that cover for game is sufficient; but very often his interest and anxiety about them go no farther. Again, the long period that trees require to arrive at maturity and become a source of profit (most of our timber trees taking more than a man's lifetime to reach this stage), may in a great measure contribute to their neglect, and curtail planting operations, seeing how seldom one man can reap the full benefit of what he plants, while returns can be had much sooner from other investments. However, by the liberal encouragement given by the Highland Society for reports on forestry, together with the work of the Scottish Arboricultural Society, it is to be hoped that arboriculture will ere long assume the position of interest and importance which it deserves among the other rural industries of this country. It has already been remarked as a reason for the culture of trees being uninteresting to and therefore neglected by the proprietor, that they require a long time to mature themselves, but this, it is submitted, is one of the great reasons that their management should be both well understood and receive every attention and encouragement. The farmer or gardener, on making a mistake or miscalculation the one year, can in most cases rectify it the next by changing the management; but the forester cannot do the same, as in most cases it would be too late. For instance, when a certain kind of trees are planted in soils and situations unsuitable to their growth, they can never become so profitable as had the proper plants been selected. True, they may keep growing for many years, but the longer they are allowed to grow the greater becomes the loss to the proprietor; while assuming the trees to have been planted in soils and situations suitable to their growth, neglect for want of thinning, causing the trees to be drawn up to mere May-poles for a number of years, cannot be put to rights in a year or two by changing the management. In many instances of this kind of mismanagement the most profitable plan would be to cut the whole down, though at a great sacrifice. Again, the *over* thinning of a plantation may so ruin it that no after management would remedy the mistake. Indeed, the expense of thirty or forty years may in this way be destroyed in one season, and evil done, over and above the great money loss, which it would take a lifetime to repair.

Another drawback to good forestry, is the great preservation of game on some estates, which for the sake of quiet and cover often retards thinning and the other departments of wood management. But such is not the case on all estates where game is preserved, as on some it has, on the contrary, been the means to a certain extent of improving the plantations, by having them well and properly thinned, so as to give light and

air for the greater growth of underwood, and thereby giving plenty of room, &c., for the trees which have reached a certain stage to improve; thus also doing away with the false system of drawing up the trees to mere branchless poles, and giving them instead a free circulation of air, and plenty of sun and light for their better development. Without a proper amount of foliage trees cannot be expected to thrive, and this cannot be obtained without proper and judicious pruning and thinning.

Pruning should, in the writer's opinion, be most sparingly performed, as he believes the pruning-hook and saw, when imprudently used, are the greatest enemies of the forest tree. Still in some cases this mode of treatment cannot always be avoided, where profitable timber is the object in view. It is unfortunately no uncommon thing to see trees pruned of their side or lateral branches to three-fourths of their height by mere rule, whatever be the size of the branches, and in complete disregard to the special circumstances and character of the case; but such a system it is considered is quite opposed to nature, and will utterly ruin the health of the trees operated upon, as well as destroy the relative value of the timber after being cut down. Some, on the other hand, advocate that no pruning at all is necessary for the growing of clean and sound timber, and suggest the keeping of the trees growing more closely together, so that they may to a certain extent draw up one another and prune themselves; but this practice is not altogether to be recommended. As before stated, trees must have light and room to grow well, and in a healthy state, and at the same time they must be kept within the bounds by the aid of the pruning-knife, commencing when the trees are young. Any of the laterals that are inclined to ramble, and also the lower branches, ought to be removed, or shortened so that they may not get too strong and large to be removed at any future pruning, close to the stem. This operation should be renewed every two or three years, as may be found necessary and circumstances determine; but as a rule little pruning will be necessary after the trees have been about thirty years planted, if they have been properly treated in their youth. In pruning hardwood trees it is very desirable to keep the side branches within good bounds where there is any tendency in some to grow stronger than the others, and to keep them as far as possible free from double tops, and confine them to good single leaders.

Coniferous trees seldom require pruning further than relieving the leaders by shortening one or more where they exist, and this may often be done by disbudding. Neither in hardwood nor coniferous trees does the writer approve of pruning except where actually necessary. In many cases little or nothing is required—sometimes nothing more than the shortening of a side branch

or the relieving of the leader; and if there is in any case a doubt as to the propriety of using the pruning-knife at all, it is always safe to "let well alone."

The thinning or non-thinning of plantations in their youth, or during the first twenty years of their growth, will have much to do with their after welfare, and as to whether they will turn out a profitable or a losing investment. This will be the case whether the wood has been planted for shelter or ornament, or with the view of being cut and sold as timber. There is very little doubt that there is more loss to the owners of plantations by their neglect and want of thinning than there is by over-thinning, although the mistake may be made on either side. Where plantations have not been regularly attended to and thinned in their youth, much more care has to be exercised in their after management, so as not to expose them too much at once by changing them from one extreme to the other. Such a change is more especially to be avoided where the situation is greatly exposed to cold and wind, as in such cases many of the remaining trees might be overthrown by wind storms, and suffer much from severe exposure after being closely nursed. Where practicable, it is a good system to thin at first with moderation, and do a little more often, as severe thinning at one time, with the view of nothing farther being required for long afterwards, is dangerous, and not to be recommended.

In the practice of thinning it is not necessary that the trees left should stand at equal distances from one another, although the more regular they remain after thinning the more pleasing they will appear to the eye; and this uniformity should never be altogether lost sight of. When the trees have encroached one upon another with their branches, and require more room for their better development, it will be necessary to perform the work of thinning, and in so doing it is the wisest course in the end to leave the best and most healthy of the trees, even should they not be growing exactly in the place one could have wished, so as to make the trees appear more regular. In thinning a plantation the writer goes before the cutters with what assistance may be required, and marks all the trees to be taken out. When of small size they are cut down with the axe, and if of large size they are sometimes felled with the saw and axe, or axe alone, should the situation be of a nature inconvenient for the use of the saw. In the felling of large timber the saw is the preferable mode of procedure, as it destroys and cuts away less of the timber than felling with the axe, and in many cases saves nearly as much in the value of wood as the cost of the labour of felling. The felling of timber by the saw is much more practised in Scotland than in many parts of England and Wales, where the axe is often used for all sizes of trees. Where plantations have been

drained before planting, it will be found necessary in most cases to have them looked over and cleared after the thinning of the wood has been performed and all the cut trees removed. Where the ground is level and of a tenacious character, they will require to be often looked after and kept more clear; while if the ground be of an open nature, with a good fall or slope, the drains in many cases will require little clearing after the ground has once got thoroughly dried and the trees attain an altitude of from 15 to 20 feet.

The *first* plantation to be noticed contains about 4 acres, and is situated about five miles inland from the sea, and about 400 feet above sea-level. It is comprised of oak, larch, Scots, and spruce, with a few Austrian pines and alders, and has been planted about fourteen years. The ground had been originally under agricultural management, and had been under or furrow drained with pipes several years previous to being planted; but the sub-soil being of a close and clay nature, it had not got thoroughly dry, and this circumstance operated much against the trees, especially the larch, as these had an unhealthy and mossy appearance when the plantation came first under the writer's notice. The first thinning was performed before that time, and the plantation was afterwards thinned in the year 1870, when about 200 trees per acre were removed, all of which were used for fencing rails, stakes for garden purposes, &c., the value being about 3s. per dozen, or L.2, 10s. per acre, as the total value of the thinnings.

Gorse or whins had been sown at the time of planting, which afterwards sprung up and grew most luxuriantly, especially in one part of the plantation, where they had actually injured the trees. In addition to doing this damage, the gorse was found to be very inconvenient and troublesome at the cutting of the thinnings, and was therefore all cut down and burned along with the branches of the thinnings. The cost of thinning, dressing, and carrying out the poles, and burning the branches and the gorse, amounted in total to L.3, 3s. 7d., or about 16s. 10d. per acre. After having the ground thoroughly cleared of the branches and gorse, it was all drained with open drains 2 feet deep, 3 feet wide at top, and 6 inches wide at bottom, at distances ranging from 8 to 12 yards apart, where the digging of them was most convenient and least destructive to the standing trees, care being taken in placing the drains to have them in such positions as to get through between the trees without injuring their roots; the total expense of draining being L.8, 12s., or about L.2, 3s. per acre.

The hardwood trees were at the same time all looked over and pruned where necessary, any double leaders being removed, and the lateral branches shortened where requiring.

The same plantation was again thinned in the spring of 1873, when about the same quantity of trees were taken out as before, giving preference to the Scots and spruce for the main crop in places where the oaks had failed or been destroyed. The thinning, dressing, and carrying out of the trees in this instance costing L.1, 7s. 6d., and the poles averaging in value 5s. per dozen, or about L.4, 3s. 4d. per acre.

The hardwoods were again gone over with a view to pruning, but very little was required.

All the trees had made considerable progress since the previous thinning, some of them adding about 6 feet to their height and proportional girth, the former operations having very much promoted the free circulation of air throughout the plantation. The larch had, as a rule, overgrown the other trees; but as they had been only intended for nurses, they had to be liberally taken out, although the doing so, to a certain extent, detracted from the appearance of the plantation.

*Fences.*—Along the south side is a stone and lime wall in good repair, 4 feet high from the outside; and on the east side is a stone wall and thorn hedge for about 50 yards; and the remainder of that side, as well as the north side, is protected by a thorn hedge alone. No fence is required on the west side, which adjoins another and much older plantation, and which latter also shelters the plantation under notice from the severe and prevailing west winds. It has a full exposure to the north or sea side, but this has had little damaging effects on the health of the trees beyond a few along the side of the fence on the margin of the plantation. The east is again well sheltered by a high wall of a neighbouring park, inside of which a belt of planting runs parallel with the wall and the plantation, and having only a public road between them.

The draining of this plantation has materially benefited its growth, and it has made great progress since. Although some parts of it are rather bare where the plants had never started well, owing probably to the wetness of the ground before draining and the pooriness of the land, it now looks, on the whole, in a very healthy state, and has every appearance of turning out satisfactorily, both as a profitable and an ornamental plantation.

The plantation at present contains about 450 trees per acre, worth, if cut now, about 25s. per hundred, or L.5, 12s. 6d. per acre; but, prospectively, nearly four times that value as a plantation. It will again require thinning in the course of two more years, and the hardwoods will be looked over next season, when any necessary pruning can be performed.

The present average height of the different varieties of trees,

the height to the first branches in feet, and the quarter girth at 2 feet from the ground in inches, are as follows:—

Names of Trees.	Height in feet.	Height in ft. to first branches.	Qr girth in inches 2 feet from ground	✓
Oak, . . . .	17	3½	2½	
Alder, . . . .	30	7	3½	
Birch. . . . .	16	3	2	
Larch, . . . .	26½	2¼	4	
Spruce, . . . .	20	2	3	
Scots fir, . . .	17	2½	3¼	
Austrian pine,	13½	2	3	
Pinaster, . . .	14	2	3	

*Second.*—No. 2 is a plantation of about eight acres, distant also about 4 miles from the sea, and about 600 feet above sea-level. It is comprised of oak, larch, and a few spruce, Scots firs, and Austrian pines, and is about eighteen years old. The oaks are not very regularly dispersed over the plantation; but over a great part of it there are sufficient for the ultimate main crop, with the exception of a small portion where the ground is of a very poor quality, in which place larch and Scots will have to be left, giving preference to the Scots.

The soil for the greater part is of a light loam, resting on a gravelly clay, in which the trees are thriving well where sheltered. The portion where the trees are thin and insufficient for a crop, is a high portion of the enclosure, and which at the time of planting had been sown with gorse, no doubt with the view of shelter. The gorse had possibly been left uncut, until it had overgrown and choked the plants, and this, together with the exposure to extreme prevailing west winds, accounts sufficiently for the failure.

This plantation was thinned and pruned in the spring of 1870, when about one hundred trees per acre were removed, principally of the larch, and all of which were used for fencing, posts for erecting wire-netting for the protection of young plantations, and other estate purposes. The hardwoods were all at the same time looked over, and pruned where necessary, the side or lateral branches being shortened where straggling, and the under branches reduced in length, with the view of being entirely removed at the next pruning. All unnecessary leaders, where more than one existed, and any branches interfering with the same, were also cut away.

The trees removed contained a little over one-half cubic foot each, and were worth about 6s. per dozen, or L.2, 10s. per acre; the total cost of thinning and pruning in this instance amounting to L.4, 19s. 10d.

The next thinning the plantation received was performed in



the spring of 1873, when 42 dozen trees were removed, and, as before, principally larch. The plantation had made rapid and great progress since the previous thinning.

The trees thinned out in this instance, with the exception of a few dozen which were kept and used for estate purposes, were principally sold lying within the plantation, after being carried out to the drives, and they were taken away as they were carried out.

The plantation had been thinned before coming under the notice of the writer, and taking soil and expense into consideration, had the plantation not been early and timely thinned, the trees would not have arrived at near their present size in the same time. As they now stand they have ample room and abundance of branches and foliage, the larch and other nurses having branches to near the ground. In the present instance the operation of thinning was valuable, in making room for the trees left standing to thrive, even had those removed been of no value whatever.

Pruning the hardwoods, where necessary, was on this occasion performed in the same manner as before, relieving leaders, and shortening some of the side or lateral branches, and cutting close to the stem the bottom branches that had been previously shortened.

The total cost of thinning and pruning and carrying out the thinnings was L.4, 10s. For those sold 10s. per dozen was received, or about L.2, 12s. 6d. per acre.

The plantation is intersected with good wide rides or shooting drives, providing ample convenience for the removal of the thinnings, and which are mown and cleared every year.

Open drains had been cut about 1 foot deep and about 12 yards apart throughout a portion of the plantation, but they had got filled up with the branches of the thinnings and herbage, &c. However, the greater portion of the ground being naturally pretty dry, and having a good slope towards a small glen through which a small rivulet runs, it was not thought necessary to have them cleared out.

The ground, previous to planting, had been under cultivation, and along two sides of it a wire fence had been erected and a hedge planted, but which never was a sufficient protection against stock. The other sides were protected by old hedges and open ditches; but as the adjoining ground is now all planted except on one side, these fences are no longer necessary, and have therefore, to a great extent, been removed.

On the east side is a plantation of over fifty years' growth, consisting principally of Scots fir and larch, with a few hardwood trees, which provide good shelter from that direction; but on all

the other sides the plantation is completely exposed, and receives the full blast of the prevailing west winds. These blasts leave their mark on the trees along the margins of the plantation and along the sides of the drives, and exposed positions, where the leaders and foliage, especially of the larch, are damaged to a great extent, making the trees appear stunted in their growth. The injury would, however, have been much more serious had the plantation been neglected for want of thinning; but where the trees are moderately sheltered, the plants are in a most healthy state of growth. With the exception of the small portion above referred to as having few trees, the plantation contains about 300 trees per acre, of an average value of 1s. each, if cut down at present.

Several of the spruce, Scots, and Austrian firs were planted a few years after the others, which, therefore, are not so large as their neighbours.

The following is their height, and height from ground to first branches in feet, and quarter girth in inches at 2 feet from the ground:—

Names of Trees.	Height in feet	Height in ft. to first branches	Qr girth in inches 2 feet from ground.
Oak, . . .	18		
Scots fir, . .	24		
Spruce, . . .	22		
Larch, . . .	27		
Austrian pine,	12		

From the above particulars it will be seen that the trees are in no ways drawn up nor branchless, but having good girths for their length. The larch and firs taper gradually to the top, with abundance of branches to near the ground. This gives them a healthy and strong constitution, and allows nature an opportunity to work its part in the development of good and sound timber.

*Third.*—Plantation No. 3 is what may be termed a mixed hardwood plantation, from forty to sixty years old. It is at a distance of about eight miles from the sea, and from 400 to 600 feet above sea-level. It covers an area of about 44 acres, and consists of oak, ash, elm, sycamore, birch, and alder, with a few larch and spruce.

The character of this plantation, from the differences of the ages and sizes of the trees in three different portions of it, necessitates its being treated under three different heads.

The first of these to be noticed extends to about 22 acres, and is principally composed of trees about fifty years old, with a small portion under trees of longer standing and larger. Little

attention seems to have been paid to thinning during the earlier stages of the growth of the trees, and consequently they were, previous to the last thinning, growing very close to one another. With the exception of a few wych elms of longer growth, which had been left at a former falling of the plantation, and which had an average supply of branches, the trees generally were very much drawn up. This division is on a sloping bank, facing for the greater part to the east, and a small portion to the north; and from its being moderately well sheltered, it afforded a favourable opportunity for a successful and thorough thinning.

This portion (with the exception of the oak, which were cut in summer and peeled for the sake of the bark) was thinned during the winter of 1869 and 1870, when about two-thirds of the trees were taken out. In the performance of this work great care was taken to leave the best and the most healthy trees, and those having the best supply of branches. More trees were removed than otherwise would have been done had the plantation been previously thinned to a moderate extent, as many of them had very few branches—only a few at the top—and therefore were not worth leaving, having no appearance of ever improving or becoming more profitable.

Before thinning, about 300 trees were growing per acre, in about equal quantities of ash, elm, oak, and sycamore, about 100 larch, and a few birch, alder, &c., and were all growing partly in clumps and partly mixed. About 200 trees per acre were removed in the following proportion:—Ash, 70; oak, 37; larch, 3; and mixed hardwoods, 90. The following is the average contents of the different kinds of trees:—Ash rather less than 4 feet each, elm and sycamore rather over 3 feet each, the oak about  $3\frac{1}{2}$  feet, and the larch 10 feet each. The trees removed varied much in size, many of them containing less than 1 cubic foot each, on account of their being overgrown by others. The bulk of these were sold, with the exception of a few ash and oak, which were used for fencing and gate-making, and the ash for other home purposes.

The following prices were received for the various varieties of trees, viz.:—ash, 8d. per ft.; elm, sycamore, birch, and alder, &c., 7d. per ft.; larch,  $10\frac{1}{2}$ d. per ft.; and oak, 7d. and 10d. per ft.; and for the bark, 84s. per ton in the rough state, direct from the plantation.

The trees after thinning stand about 20 feet apart, or 100 trees per acre, and have improved much since the thinning, showing the beneficial result of the same. Upon examination, their dimensions are found upon an average as follows, viz.:—

Names of Trees.	Height in ft.	Ht. in ft. to first branches.	Qr girth in in. 4 ft up.	} = L.31, 10s. per acre.
Oak, . . . .	45	25 $\frac{3}{4}$	9 $\frac{1}{2}$	
Ash, . . . .	55	30	7	
Elm, . . . .	52	18	8 $\frac{1}{2}$	
Sycamore, . .	55	23	7 $\frac{3}{4}$	
Birch, . . . .	45	25	8	
Alder, . . . .	45	30	6 $\frac{1}{2}$	
Gean, . . . .	44	10	10	
Larch, . . . .	63	36	11 $\frac{1}{4}$	
Spruce, . . .	56	24	10	

Oak, ash, elm, and sycamore are in about equal quantities, with only a few of the other varieties of trees, there being only about thirty larch in the whole plantation, with about half-a-dozen spruce.

This portion of the plantation has a road running through its centre from north to south, for the convenience of removing the thinnings, &c. There is also a public road leading from east to west, along the bottom of the bank facing the north; and an accommodation road runs through the south end of this portion, also from east to west, into both of which the road through the centre has access. The last or south road divides this portion from the part next to be noticed.

The second portion of the plantation is about 440 yards long, varying from 100 to 200 yards wide, and contains about 15 acres. It is situated mostly on a sloping bank, with a few undulations in several parts. It is about the same in altitude as the division adjoining, and comprised of the same variety of trees, which are rather smaller in size. Thinning was performed in the autumn of 1870 (with the exception of the oaks, which were left and peeled in the summer of 1871), and in consequence of the trees being smaller, and nearly 200 trees per acre more growing than on the preceding lot, those trees left growing stand closer together. 2800 trees were taken out, or about 187 per acre, and about 164 trees per acre left of an average of the whole portion. From the trees being smaller, and more equal in size, it was less difficult to thin than the portion already referred to. Nearly all the trees taken out in the winter were sold, and also a great portion of the oak; the former being sold at L.1 per dozen on the ground, and the oak at 7 $\frac{1}{2}$ d. per foot; the whole of the trees averaging about 2 $\frac{3}{4}$  feet each.

Previous to the thinning the trees were growing at an average distance of from 11 to 11 $\frac{1}{2}$  feet apart, or 351 trees per acre, while those left now stand at an average of 5 $\frac{1}{2}$  yards apart.

The plantation has improved considerably since being thinned, but the trees appear very small of their age. This arises from the number growing on the ground so close to one another, causing a want of room, and of light and air for their better and

quicker growth. This circumstance is also quite sufficient to account for their small value per cubic foot.

All the worst trees, and those having least branches, were taken out; many of them were very long, with only a few branches at the top, and of small girth for their length. The trees left growing are also of small girth for their length, which will be seen from the following table:—

Names of Trees.	Height in ft.	Ht. in ft. to first branches.	Qr. girth in in 1 ft. up.	: L.25, 12s. per acre.
Oak, . . . .	46	25		
Ash, . . . .	54	28	7	
Elm, . . . .	45	21	7	
Sycamore, . .	48	22	7 $\frac{1}{2}$	
Birch, . . . .	50	24 $\frac{1}{2}$	7 $\frac{1}{2}$	
Alder, . . . .	44	28	7	
Larch, . . . .	60	36	10	
Spruce, . . .	30	4	6	)

The remainder, or last portion of this plantation, is partly of the same age, and partly much older than the two last noticed, some of the trees being apparently from sixty to seventy, and the rest from forty to fifty years old. This portion of the wood principally consists of ash and elm, with a few oak and sycamore, and one or two birch trees. The writer has no knowledge of when the plantation was thinned before the winter of 1870 and summer of 1871, during which time it was last thinned.

This portion is also on a sloping bank, facing the north, with a small portion of table-land on the top, and contains about 7 acres. In other respects its situation resembles the divisions already referred to.

In thinning, about 130 trees per acre were taken out, which varied much in size. The trees before thinning were growing at from 13 to 14 feet apart of an average, but very irregularly, some of them being much closer, and others at greater distances. The oldest trees were very long, and much drawn from growing so close to one another, especially the ash, many of them measuring between 40 and 50 feet to the first branch, with quarter girths of from 8 to 12 inches at 4 feet from the ground.

The greater portion of the thinnings were sold, with the exception of some of the oak. The trees cut in winter, all measuring 8 inches and upwards in girth, were sold at 9d. per cubic foot, and all smaller ones at 7d. per foot. The oak drew 7 $\frac{1}{2}$ d. per foot, and the bark from this and the last-mentioned portion, 95s. per ton in the rough state.

All these prices may appear small, but this is easily accounted for by the fact that the quality of the timber taken out was the least valuable, while the plantation was at a long distance from a railway station, and the road was exceedingly bad, and very

hilly, preventing large loads being taken without extra horses assisting up the hills. Distance from railways, or canals, or sea-ports are, as well as bad roads, great drawbacks to the sale of timber, adding materially to the cost of labour, and reducing the value of wood in the plantation.

The following is a table similar to those already given:—

Names of Trees.	Height in ft.	Ht. in ft. to first branches.	Gr. girth in in. 4 ft. up.	} = L.43 per acre.
Oak, . . . .	45	18	12	
Ash, . . . .	55	34	10	
Elm, . . . .	46	21	13	
Sycamore, . .	40	18	9	
Birch, . . . .	40	20	13	

The felling of the thinnings was done by the proprietor's own men, portions 1 and 3 at 6s. per 100 feet, and No. 2 at 2s. per dozen trees, and stripping the bark of the oak at 32s. per ton.

No pruning was necessary throughout the plantation. Indeed, a great number of the trees have too few branches, although, in the writer's opinion, this misfortune may through time, to some extent at least, be remedied. However, had the last thinning been performed twenty years earlier, and the trees left growing the same distance apart at that date as they are now, the plantation would have been much more valuable than it is. But the whole plantation has improved very much since the last thinning, and has now every appearance of becoming a profitable and valuable crop. The trees have now sufficient room to grow, and receive ample light and air, the greatest drawback being the want of branches and foliage.

There was a good quantity of hazel and other underwood growing throughout the whole plantation, which was all cut down before commencing the thinning operations, being of little value further than for shelter and game cover. A portion of it was tied up into faggots for heating baking ovens for home use, and a small portion of it sold for the same purpose. The binding of the faggots cost 7d. per score, and the wood was sold for 5d. per score untied, to be bound by the purchaser. Another portion was tied up for repairing sea embankments, pea-stakes, and thatching-rods, &c. All the cutting of the underwood was performed by the proprietor's own men, and by day's wages.

Throughout portions of the plantation there is a luxuriant natural growth of ivy. Its presence is not a little injurious, having overgrown some of the older trees, and made a beginning upon others; but comparatively slight damage has as yet been done to the growing trees. Although some of the ivy was cut and removed along with the thinnings, it was considered advisable not to make a complete sweep of it all at once, in case more serious damage would be done to the trees by leaving them sud-

denly bare and exposed. Now, however, it is intended to commence cutting and clearing to some extent at least, with the view of having it gradually exterminated.

The soil is of a deep rich loam, and very favourable for the growth of trees.

The whole plantation is moderately sheltered, and not more than half-a-dozen trees have been thrown over by wind, within the last five years, neither before nor after thinning.

Fences round the plantation were principally hedges of hazels and thorns, on the tops of banks, with the exception of the east sides of portions 1 and 2, being along the bottom of the wood, where a small stream runs; and No. 1 is partly protected by a common rail fence, 460 yards long, and partly adjoining another plantation, no fence being necessary. This rail fence was renewed after the thinning of the first part, from material taken from the thinnings, the old fence being entirely done. The old hedges had often been repaired by partly railing, and by filling up gaps with dead thorns and branches, &c., which naturally killed and destroyed the hedges; but there is no appearance of there having been good fences formerly. Along the top of the second portion the hedge has been repaired by a rail fence erected in the gaps for nearly 600 yards. All round the remainder of No. 1 portion, and No. 3, a wire fence has been erected, consisting of oak posts at 5 feet apart, and from two to six wires of the best bright wire, for a length of 1568 yards, in some cases tightened and fastened with patent winders, others with bolts, and nuts and screws, and others round the posts. The fence varies very much in height, some parts being on the tops of banks of different heights, and others on the level ground. The new fence was not erected in all places on the site of the old, but straightened, and some new land taken in and planted, with the view of shortening the fence and improving its line, and adding to the plantation.

NOTE.—As prevention is at all times better than cure, attention in the early management of plantations saves great trouble and expense in their after management, for when they are neglected when young, it generally takes many years to improve them; and even sometimes this is impossible, when nothing will do but cutting down and replanting. We would therefore say, thin and prune early and regularly, but the less of the latter the better, and better no pruning at all than over pruning.

## ON THE INFLUENCE OF GEOLOGICAL FORMATION ON THE HEALTH AND DEVELOPMENT OF SHEEP.

By JOHN M'CULLOCH, Agnew Crescent, Stranraer.

[*Premium—The Medium Gold Medal.*]

WHEN we consider the immense number of sheep (between thirty and forty millions) grazed and fed on the pastures and green crops of Britain, we naturally conclude that anything likely to improve our knowledge of the sheep in health and in disease, with the causes which tend in either direction, cannot fail to interest not only those who are most intimately connected with their breeding and feeding, but also the general community. The growing importance of their wool is shown by its providing employment for 350,000 operatives, and of their mutton by the numbers quoted as a weekly supply in the leading markets—London requiring 60,000, Liverpool 12,000, and others in proportion.

The relation between geology and agriculture arises from the fact that the soil of the earth is composed of the disintegrated fragments of the rocks of which its crust consists. These may either be material derived from the rocks which they overlie, or that from others, which has been transported from a distance. In either case, but more certainly in the former, a knowledge of geology assists the inquirer in determining the class of soil, and of the cattle and sheep which ought to be fed upon it. It is evident that, in treating of this subject, the effects of the underlying rock may be mistaken for those of material transported on to it, and *vice versa*; but a more serious difficulty presents itself in the risk of attributing the effects of climate, management, &c., to the geological formation. One of our correspondents in the north of Scotland aptly remarks, that often as much depends upon the formation of the sheep farmer's head as on the geological formation of the land upon which his sheep are reared and fed. The effects of the different formations will be taken in the most generally accorded order of geologists, beginning with the lowest.

*Granite.*—The idea which prevailed among the earlier geologists, that granite was a primitive or fundamental rock, has, on its igneous nature becoming known, given place to a more modern theory, which regards it as having cooled slowly, at a great depth from the surface, and consequently under great pressure. This theory is favoured by the solid crystalline mass which it presents, but its fundamental character is so far borne out by the fact that no great mass of any other rock has been found beneath a similar one of granite. It is generally associated with the older trappean rocks, and often forms the apex



of a mountain range. The principal constituents of granite and trap rocks, generally known as igneous rocks, are the minerals, or, more strictly speaking, the mineral families of quartz, mica, felspar, and hornblende.\* The following gives the chemical composition of several of their subdivisions:—

	Silica.	Alumina.	Magnesia.	Lime.	Potash.	Soda.	Oxide of Iron.
Orthoclase, . .	64	19.16	.60	.78	11.7	2.49	...
Albite, . . .	68.84	20.53	...	...	...	9.12	...
Porphyry, . .	71.50	15.50	.50	1.73	3.16	5.94	...
Oligoclase, . .	62.87	22.91	...	3.61	1.39	8.16	1.89
Hornblende, . .	45.69	12.18	18.79	13.85	...	...	7.32
White Mica, . .	42.5	11.5	.9	...	10	...	22
Black Mica, . .	40	12.67	.63	...	5.61	...	19
Quartz, essentially Oxide of Silicon.							

Granite rocks are composed of felspar, quartz, and mica, and differ from the trap in the large quantity of quartz entering into their composition. If the orthoclase variety predominate, the rock is reddish; if the albite, it is whitish; if well balanced, it is a real grey: but the mica and quartz also influence the colour, according to the kind and proportion. The Aberdeen granite is real grey, the Peterhead reddish, while those of Kirkcudbrightshire are from a whitish to a darker grey. A granite, calculated by Professor Haughton to contain 27.66 of quartz, 52.94 of felspar, 14.18 of white mica, and 5.27 of black mica, analysed as follows:—

Silica, . . . . .	72.07
Alumina, . . . . .	14.81
Peroxide of iron, . . . . .	2.22
Potash, . . . . .	5.11
Soda, . . . . .	2.79
Lime, . . . . .	1.63
Magnesia, . . . . .	0.23
Loss, . . . . .	1.09

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100.09

In some granites the silica ranges from 66 to 80, the alumina from 11 to 18, the potash from 4 to 12 per cent., and sometimes the soda is higher than the potash. The granites generally show the orthoclase or albite, the micas, and quartz, embedded in a felspathic paste. From the effects of the exposure to the atmosphere the iron is liable to change, the silica which is united with the potash is displaced by the carbonic acid of the rain water, and this denudation forces the material set free on to the lower lying lands in the vicinity. The felspathic paste

\* Lyell's "Principles of Geology."

contains some 8 per cent. of potash and soda; and where this is washed on to a trap rock, also containing a considerable proportion of these alkalies, we may conclude that they are then in abundance. This is partly borne out by a section of arable land, on the edge of the Criffel range, on the trap, and with the denuded material from the granite overlying it, which, though poor land, grows good crops of turnips and potatoes; these, as is well known, requiring potash and soda in large quantities. If such large percentages of these alkalies are, in the grass and turnips produced, hurtful to animal health and life, then we consider we have arrived at a probable cause of a disease, which is known in connection with granite soils, called "vinkish" or "vanquish," and which may be interpreted into a wasting away. When sheep are first affected with this disease, they become watery about the eyes, lose their middle, altogether assume an unhealthy appearance, and if not immediately changed on to some other formation, large numbers die. The change on to "Old Red," "Carboniferous," or more especially the "trap" (better known as "bluestone" or "whinstone") acts like magic, and if not too far gone, they soon recover. The disease is severe on lambs or hoggets, and is rarely so on older sheep. Ewes and lambs do well, except that the lambs must either be sold as such, or at the least changed for six weeks or so on to some other formation. In a *post-mortem* examination there is nothing abnormal except the stomach, which is withered or shrivelled, and, according to medical authorities, presenting much the same appearance as that of a human being poisoned with those alkalies—their caustic nature having the effect of causing such a contraction. On the Criffel range, with which the writer is familiar, the disease is rare on the pure granite, but is very prevalent, especially in the spring months, on the arable land of the eastern side previously alluded to. On the western side, where the pure granite goes on to the lower lands, the disease is mild, and in some seasons is altogether escaped, thus showing that the detritus of the granite washed on to trap has a worse effect than on its native rock. On the upheavals of the north of Kirkcudbrightshire, this disease is traced to the pure granite, and where the detritus is washed on to the bluestone, no difference has been observed from the pure trap. Our correspondent has perhaps not taken sufficient care in his investigations to discriminate between them, and suggests the want of sulphur in the granite, as the cause of "vinkish." According to Geikie and other geologists, sulphur is found in no appreciable quantity in any rock, but nevertheless it is found entering largely into the composition of wool. Our own observation has gone in the direction of proving that the bluestone on the western side of the Cree, where there is no granite at all, is much healthier

than the eastern side, where the rock is a conglomerate, and where the young sheep are almost invariably wintered out to protect them from this disease. A Wigtownshire farmer, holding land in Kirkcudbrightshire on the trap, but with granite detritus washed on to it, was surprised at the death-rate being three times more than on the pure trap of Wigtownshire, and this too when the lambs were divided for the purpose of testing it. On this account, he has now only old sheep for wintering on turnips on this farm. From Aberdeenshire our correspondent can trace no difference in the one from the other, and gives as death-rate close to the granite, but on the trap, 3 per cent. From Sutherland we find that almost the best sheep are grown on granite patches, with moss intervening, and with no more than an ordinary death-rate. The general death-rate of Sutherland ranges from 5 to 8, and that of hill pasture in Kirkcudbright ranges from 5 to 15, while in Wigtownshire on the pure trap it ranges from 2 to 8 per cent.

*Trappean.*—The word trap is of very variable significance among geologists, being sometimes used to designate hornblendic and augitic rocks, and at others to include all rocks of volcanic origin from which the craters and all signs of recent volcanic action have been removed. A subdivision is, however, given into hornblendic and felspathic traps, the former comprising the more silicious, the latter the more basic. The analysis of a felspathic trap, containing 34.09 of quartz and 64.44 of felspar, gave—

Silica, . . . . .	76.67	Greenstone consists principally of felspar and hornblende. Diorite, one of its subdivisions, gives the following:—	Silica, . . . . .	53.2
Alumina, . . . . .	9.99		Alumina, . . . . .	16
Peroxide of iron, . . . . .	3.37		Peroxide of iron, . . . . .	1.3
Potash, . . . . .	4.40		Potash, . . . . .	2.2
Soda, . . . . .	2.92		Soda, . . . . .	6.3
Lime, . . . . .	.88		Lime, . . . . .	6
Magnesia, . . . . .	.64		Magnesia, . . . . .	14
Protoxide of iron, . . . . .	.04		Protoxide of iron, . . . . .	1
Loss, . . . . .	.81			
	99.72			

100

Diallage, another subdivision, gives more lime and magnesia without almost any potash. As the trap is found over a great area in Scotland, the inquiry into its effects is of increased interest. The greater part of Galloway, Dumfries, Peebles, and Selkirk, and a considerable area of Roxburgh, Edinburgh, Haddington, Ayr, and Lanark, are on this formation. In the north, although considerably metamorphosed, it is found over the

greater part of Sutherland, Inverness, Nairn, Moray, Kincardine, Perth, and Argyll. On the southern belt sheep live and thrive well, attain great weights in short time, and disease and death are at a minimum. The arable lands are generally porous, and suited to the feeding of sheep on turnips, which is carried on successfully. According to a salesman of long standing, the best one-year-old sheep shown in Liverpool market are from the district between Dumfries and the Mull of Galloway. On the northern section of trap, disease is not more common, but the exposure at such high elevations, as on some of the mountain pastures, increases the death-rate. In fact, there are many causes which foster disease and increase the death-rate, apart from the geological formation. Overstocking and bad management have been proved to be the cause, when a change in either reduced the percentage. Diseases also are more prevalent through exposure to certain winds. In the south of Scotland exposure to the east and north causes headgrit and trembling; and on the west coast continued exposure to the moisture driven on to it from the Gulf Stream lessens the quantity and reduces the quality of the wool; the general health and growth are inferior, and the death-rate is considerably higher. As an example of the effects of exposure, we give the experience of a south farmer, who, when taking delivery of a lot of wethers in Inverness-shire, noticed a decided difference in the hirsels on either side of the watershed; those exposed to the west being leaner and the wool of a whitish unhealthy looking colour. The percentage of death is generally least on trap of all the formations, and this applies both to turnip feeding and grazing. A disease has shown itself among turnip sheep of late years, not unlike "vinkish," but has been found to be a species of blood poisoning from the excess of moisture in the winter season. It has been least prevalent on the trap and Old Red Sandstone, but this is probably to be accounted for in their porous nature in the district to which the writer refers. The trap in the north of Scotland, the north of England, and Wales, is generally healthy; and the small size of the Welsh sheep is no doubt owing principally to the exposure and want of care in breeding.

*Laurentian.*—The rocks of the Laurentian period, so called from their occurring in great force in the country drained by the St Lawrence in Canada, have been once sedimentary, but are now contorted, highly metamorphosed, and crystalline. They are of the same mineral composition as granite, the distinction being the manner in which the minerals are arranged. In them the quartz, felspar, and mica occur in layers, and thus display the schistose character of the rock. From a correspondent near where these are found in Sutherland, we find that the sheep are less in size, and with a heavier death-rate, than on the trap or

granite; but being on the west coast, the exposure is again a most probable cause.

*Cambrian*.—This name has been given on account of the beds of sandstone of this period occurring in the ancient province of Cambria in North Wales. The sheep produced on this resemble those of the previous formation; but if anything different, a little better sheep, and with slightly less death-rate. The rocks of this system are found in the west of Sutherland and Ross.

*Old Red Sandstone*.—The term Devonian has been applied also to this formation, from its occurring in Devon in large area. It is also found in Hereford, Monmouth, and Shropshire, and in Scotland in Caithness and Ross, and extending in a small belt along the shore to the mouth of the Spey. The greatest section of it in Scotland, however, stretches from east to west over Forfar, Perth, Stirling, and Dumbarton. It is found in smaller portions in Haddington, Berwick, Roxburgh, and Dumfries. The writer is only conversant with those portions in Dumfries, and on account of sheep thriving and doing well, would place it next to the trap. A correspondent of experience in this county in this agrees; but another, who has farmed on both it and the carboniferous, would prefer the latter. From Caithness and Monmouth we have ascribed to it the very highest place; but an authority of great weight in both agriculture and geology in Berwick, again places it behind the trap and "carboniferous." He, however, says that possibly a part of the inferiority may be placed to the thin and wet nature of the soil above the "Old Red" in that locality.

*Carboniferous*.—This group of rocks is so called from coal being found in beds in it. The lowest subdivision is called calciferous sandstone, is found in Edinburgh, Lanark, Ayr, Renfrew, and Dumbarton, and rests upon the Old Red and trap. In Haddington and Berwick it passes conformably into "Old Red." In the next subdivision, limestone bands are associated with sandstone, shale, or coal, with clay ironstones, and is called the carboniferous limestone. It is found in the Pennine chain of the north of England, and in Linlithgow and Fife, where it is associated with contemporaneous volcanic rocks. Millstone grit, the next subdivision, is found in Edinburgh, Fife, and Lanark, and corresponds with that in England of Derby and Yorkshire. In Ayrshire it is not noticeable as a distinct group, and there shades into the Coal Measures. The Coal Measures consist of grey and white sandstone, shales with coal seams, and clay ironstones, or of red sandstone and clays without coal, and containing limestone. From the remarks upon the "Old Red," it may be readily inferred that some give a preference to the one and some to the other, much no doubt depending on the depth and mechanical condition of the soil above. From an Ayrshire farmer, who

winters hoggets on the grass, we have the exceptional report of never having had a death; and if the soil is not too clayey, turnip sheep do well upon it. On the Mountain Limestone of England, sheep prefer the natural herbage to that of any surrounding formation.

*New Red Sandstone.*—The effects of this formation seem similar to the “Old Red;” but as the soil overlying is principally stiff, it has a decided disadvantage for turnip feeding. In Shropshire, where the soil is light, it produces the famous Shropshire Downs in great perfection.

*Oolite.*—The oolite runs obliquely from east to the south-west of England, and as the soil overlying it is generally clayey, it is not so well adapted for sheep as it would otherwise be. On grass they are very healthy, however, and very large sheep are raised upon it in Lincoln, Huntingdon, Bedford, and Oxford.

*Cretaceous.*—The chalk is extensive in England, and is found in Norfolk, Suffolk, Bucks, Berks, Herts, Hants, Wilts, Dorset, and Sussex. It produces good, healthy sheep, though not of the largest size, and seems eminently fitted for the short-woolled sheep, which may almost be said to be indigenous to it.

*Alluvial and Diluvial.*—It is not easy to determine from whence the material composing the soils of these formations has been obtained, and consequently they can only be spoken of as they are. The alluvium of Lincoln probably produces the largest sheep in Britain, and the alluvium and diluvium of Norfolk and Suffolk also grow good sheep; and from the soil of the latter being generally light, warm, and dry, it is peculiarly adapted for sheep feeding on turnips.

*Boulder Clay.*—The boulder clay of the south of Scotland and north of England is largely associated with the granite and trap formations. It, like the rocks which are found beneath, is as a rule healthy, and sheep live and thrive well upon it; but in some places the “till,” as it is called, is so impervious as to make it not so suitable for sheep-feeding as it otherwise would be.

*Peat*, though not a geological formation, may, from its large extent in our sheep-walks, perhaps be so considered. It is a recent formation, and derived from the growth of aquatic plants under circumstances which prevent their decay. It ranges from 2 to 40 feet in depth in various parts of Britain, and is associated with various older formations. On hill pastures where peat abounds foot-rot prevails, being superinduced by the excessive moisture, and also by the hoof not being worn down as fast as it grows. When water remains long stagnant on vegetation on moss land, rot or fluke in the liver is produced by the sheep feeding on the partially decayed pasturage after the water is dried up. This disease is not, however, confined to mossy soil, and in wet seasons commits fearful havoc on lands overflowed

with water. When moss is well drained and free from inundation, it produces healthy pasturage and a kind of grass known as "draw moss," which is about the earliest and best feeding for lambing ewes in spring on hill lands. When reclaimed, if not well mixed with hard land, it is very unsuitable for sheep, especially in small enclosures; the feet get bad, the wool is of poor quality, and they fatten slowly.

We have been favoured with the following from a wool-stapler of great experience in both Scotland and England:—"When in Yorkshire we got the best bred wools from near Ripon and Pontefract (magnesian limestone). From Lincoln, those near Grantham were good (oolite). The Nottingham clips gave even a higher price than those mentioned, from their combining the lustre of the Lincoln with the fineness of the Yorkshire (magnesian limestone and new Red Sandstone); perhaps partly due to the cross in breeding. Kent produces a fine wool, in much demand for the home and French markets (oolite, chalk, and greensand). Northumberland also produces good wool (carboniferous and trap). In Scotland the bred wools that undoubtedly carry off the palm are from Caithness (Old Red), and are distinguished by every good quality to be found in wool. Roxburgh and Berwick (Old Red, trap, and carboniferous) are only slightly inferior in their clips to those of Caithness. For blackfaced wool, Galloway (trap and granite) is considered to be at the top of the tree; and Perthshire stands highest for laid blackfaced (Old Red, trap, and granite). For Cheviot wool Ross and Sutherland (trap and granite) are considered superior to any other. Mossy land does not produce good wool, and the wool of blackfaced sheep has been so much improved, when changed from the hill pasture of Scotland on to rich meadows in England, that it almost lost the coarseness which distinguishes it."

We have considered that a reference to the place of origin of the principal British breeds might assist in tracing the effects of the formation. We find that Bakewell's farm, near Loughborough, is on the "New Red Sandstone," and is noted as the original home of the Leicester. The Lincoln breed originated on the fertile alluvium of the south and east of the county from which they take their name. The Romney Marsh sheep also originated on the alluvium, is large, and produces good wool. The Cotswold, bred on the Cotswold hills, has its home on the oolite. The Southdowns take their name from the chalky hills of Hants and Sussex. The Cheviot is found principally on the "trap," "granite," and "Old Red" in Scotland and Northumberland. The blackfaced is found on almost all formations, but in Scotland on the granite and trap principally.

The dry, friable, and kindly nature of the soil has often as

much to do with the health and growth of sheep as the formation on which the soil rests, and this is partly borne out by the statistics furnished by the Board of Trade, in the proportion of sheep given to every 100 acres of crops, fallow, and grass, to the total area, and to the number of cattle. The counties of England showing the highest percentage of sheep to the 100 acres, &c., are Westmoreland, Rutland, Northumberland, Lincoln, Kent, and Dorset; the lowest, Cheshire, Derby, Durham, Essex, Middlesex, Surrey, and Lancashire. To the total area, the highest are Lincoln, Northumberland, Northampton, Rutland, Westmoreland, Wilts, Kent, and Dorset; the lowest, Cheshire, Middlesex, Essex, Surrey, Lancashire, Derby, and Durham. To the number of cattle, the highest, Kent, Hants, Berks, Lincoln, and Northumberland; the lowest, Cheshire, Lancashire, Surrey, Stafford, and Middlesex. In Scotland, to the 100 acres, &c., the highest Sutherland, Argyll, Selkirk, Inverness, Peebles, Roxburgh, and Dumfries; the lowest, Aberdeen, Banff, Kincardine, Orkney and Shetland, Linlithgow, and Renfrew. To the total area, the highest, Selkirk, Roxburgh, Peebles, Berwick, Edinburgh, Dumfries, and Haddington; lowest, Aberdeen, Banff, Kincardine, and Nairn. To cattle, the highest, Peebles, Roxburgh, Sutherland, and Inverness; lowest, Aberdeen, Banff, Kincardine, and Linlithgow. In Wales, Merioneth, Brecon, and Radnor have the highest, and Pembroke, Anglesey, and Flint the lowest to the 100 acres, &c.; Radnor and Merioneth the highest, and Pembroke the lowest to the total area; and Brecon, Merioneth, and Radnor the highest, and Pembroke the lowest to the number of cattle. These proportions may to a certain extent mislead, owing to the greater or less extent of hill pasture, or the capabilities of the soil, but still they give a general idea of the counties best adapted to the sheep, as we invariably find the most suitable live stock finding their way into any district.

#### ON THE INFLUENCE OF GEOLOGICAL FORMATION ON THE HEALTH AND DEVELOPMENT OF SHEEP.

By JOHN M'MILLAN, Halketleaths, Castle Douglas.

[*Premium—The Medium Gold Medal*]

THE business of a shepherd was one of the first occupations of man which we read of in history. Abel, the son of Adam, was a feeder of sheep; and it would appear that the wealth of the ancient Hebrew patriarchs consisted in the possession of large flocks of these animals. In tending their herds, the shepherds of those periods shifted their flocks from one place to another,



in order to find them proper pasture, and there is little doubt but that these early shepherds did so by observing that certain localities produced a better quality of herbage than others; and as their sole occupation and interest was concentrated in the healthy condition as well as the productiveness of their flocks, they would lead them to those places which produced the richest grasses, so as to give health and strength to their charges.

I do not for a moment suppose that they knew the nature of the ingredients plants require or take from a soil to make them useful to maintain and develop all the various organs of the sheep. They, nevertheless, were guided by their close observation to a knowledge of those kinds of plants which were most suitable for their flocks as correctly, perhaps, as many flock-masters in our advanced times do, with all the scientific attainments of the present age. Jacob and his sons may be named as examples to prove that the study of the instinct and requirements of the sheep occupied their time, and made them travel to great distances in order to find proper pasture for their flocks.

It is, therefore, only the casual observer who thinks that all kinds of grass are the same, and equally nourishing for sheep. This, however, is far from being the case, as there are not only botanical differences, but there are also richer and poorer qualities of the same species of plant, one being more nutritious than another owing to the nature of the soil upon which it grows; and any observer accustomed to the habits of sheep will find that the natural instinct of these animals leads them to prefer or relish certain qualities of grass more than others.

The question, therefore, is—What makes this difference in the quality of herbage in different localities, and its influence on the health and growth of sheep? It has been observed that when they are pastured on land where the soil overlies certain kinds of geological formation, there is a remarkable difference between them and others of the same class fed on soils which overlie other kinds of strata, and this is often manifested by the appearance of their wool.

It is known by chemical analysis that wool, skin, hair, and horn are closely allied in their composition. They are all nitrogenous compounds, composed of the same elements, and in nearly the same proportions, being compounds of carbon, hydrogen, nitrogen, oxygen, and sulphur, with minute portions of earthy matters which give firmness to the texture. When wool is clean and dry, every 100 pounds of it will produce about 17 pounds of nitrogen and 5 pounds of sulphur. When sheep are fed on good nutritious pasture, a considerable quantity of a greasy, soapy substance, known as yolk, adheres to their fleece. When this is

abundant, it may be taken as practical proof that they are receiving the proper kinds of food or nourishment. It has also been observed, that whenever there is a deficiency of this natural soap, the wool of sheep is weak in fibre and harsh to the touch. This yolk appears to be a secretion from the glands of the skin, and contains acetate, carbonate, and muriate of potash. It also gives off a peculiar odour, which in all probability is caused by the presence of an oil undergoing decomposition, and setting free ammonia, sulphur, and hydrogen. Sheep also perspire like most other animals, and emit carbonic acid, nitrogen, and water.

Besides the matters composing wool, skin, hair, horn, and yolk, there are also the compounds or ingredients, of their whole carcass, which contains many earthy matters over and above the materials and elements already named. These are potash, soda, lime, magnesia, oxide of iron, chlorine, silica, and phosphoric acid; all these different materials being required by sheep for their healthy existence. It is, therefore, requisite that the herbage upon which they feed should contain all these in sufficient quantity, so that the animal may grow up and maintain a healthy state, with stamina to enable it to resist disease.

As the basis of the arguments I intend to advance in favour of certain kinds of soils being better adapted than others for sheep pasture, we may consider, in the first place, the composition by analysis of the different inorganic or earthy substances found in the various organs and parts of ruminating animals. First of all, there is the fluid known as blood, from which all the parts and organs of their body are supplied, and which is itself supplied from the food and drink taken by the animal. The following are the inorganic materials contained in animal blood and flesh, as given by Enderline:—

	Blood.	Flesh.
Phosphate of soda (tribasic), . . .	16.77	45.10
Chloride of sodium (common salt), . . .	59.34	45.94
Chloride of potash, . . .	6.12	
Sulphate of soda, . . .	3.85	Trace.
Phosphate of magnesia, . . .	4.19	6.84
Oxide with a little phosphate of iron, . . .	8.28	
Sulphate of lime and loss, . . .	1.45	
	<hr/> 100.00	<hr/> 97.88

I may here remark, that the blood is the common nourishment running through the system, from which every organ selects the mineral substances it specially requires. It is hardly necessary to observe, that the proportion of earthy matters in different organs varies very much. One organ takes up potash in preference to soda, and another phosphorus and lime and no potash or

soda, and so on in great variety. It will also be observed, that there are ingredients in the blood which, although not forming organs, are yet essential as carriers or operators, inducing the reactions required for maintaining life.

The bones of sheep contain from 60 to 70 per cent. of phosphate and carbonate of lime, with a little magnesia, but only a mere trace of the alkaline matters, potash and soda, which are so essential for some of the other organs, and probably also necessary for certain changes in the animal economy, because considerable quantities of these are found in the urine and excrementitious matters in a condition different from that in which they were taken by the animal in its food.

It has been computed by chemists that the urine of sheep contains nearly 2 per cent. of mineral matters, of which the following is found to be the composition:—

(*Johnston.*)

Sulphate of potash,	2·98
Sulphate of soda,	7·72
Chloride of sodium,	32·01
Chloride of potassium,	12·00
Carbonate of lime,	·82
Carbonate of soda,	42·25
Carbonate of magnesia,	·46
Phosphate of lime, magnesia, and iron,	·70
Silica, . . . . .	1·06
	<hr/>
	100·00

And dry sheep dung, after incineration, leaves about 13½ per cent. of ash, the composition of which is given by Dr Anderson as follows:—

Silica, . . .	50·11
Potash, . . .	8·32
Soda, . . .	3·28
Chloride of sodium,	·14
Phosphate of iron,	3·98
Lime, . . .	18·15
Magnesia, . .	5·45
Phosphoric acid,	7·52
Sulphuric acid,	2·69
	<hr/>
	99·64

When so much earthy matters are required by sheep in order to supplement their waste, and to build up in them a healthy organism, and when we know that the principal source from which all these materials are supplied is the soil through the medium of the plant, it is evident, as has been expressed by a

recent author, that "the dead earth and the living animal are but links of the same chain of natural existences, the plant being the connecting bond by which they are tied together."

Besides the plant, there are other two sources of nourishment to be considered, viz., the air and water. The composition of air may be given as follows—every 100 parts contain the following proportions of

Nitrogen,	.	.	.	.	.	.	.	79
Oxygen,	.	.	.	.	.	.	.	20
Carbonic acid, watery vapour, ammonia, &c.,	.	.	.	.	.	.	.	1
								<hr/> 100

The two first of these elements are constant, but the latter substances are variable. The principal agent required for the maintenance of life is oxygen, which combines with the waste carbonaceous matters of the blood, removing them as carbonic acid, and also otherwise renewing the system. The following table shows the nature of the change which air undergoes by being breathed, keeping the nitrogen constant and in round numbers:—

	Air as inhaled.	Air as exhaled.
Nitrogen	79	79
Oxygen,	20	16
Water, carbonic acid, &c.,	1	5
<hr/> 100		<hr/> 100

Water, when pure, is composed of two elements—oxygen and hydrogen; but, in the condition in which it is drunk by sheep, it contains minute quantities of many earthy matters, through or over which it has passed. Hence, as formerly stated, all the inorganic mineral materials, essential to the life and healthy growth of the animal, are obtained through their food and drink; so that, whenever the herbage and water are deficient in these, or any portion of these constituents, the animal becomes weak and unhealthy.

In certain localities it may be that the herbage is deficient in some one of the necessary elements, in which case, if the water they drink be capable of supplying this deficiency, the sheep will grow up healthy. For example, if sulphur, which is one of the necessary constituents of the wool, be wanting in the herbage, it may be supplied by the water, as spring water generally contains a portion of sulphates in solution; so that were sheep feeding upon such herbage and drinking water containing sulphates, the sulphur would be thus supplied, and the fleece maintained in a healthy condition. But, if both the water and herbage were deficient of this ingredient, the wool would not be

of such good quality. In such a case it should be supplied artificially to the water or the soil.

As all soils are made from the *debris* of rocks and minerals, the composition of such becomes an important inquiry for the flockmaster, as it is from them that all kinds of plants obtain their mineral constituents, these being absorbed into the grass through the medium of water. Hence, geological formation becomes an important matter of consideration to the sheep farmer.

Rocks, properly speaking, are composed of different minerals. For instance, granite is composed of varying proportions of three minerals—quartz, felspar, and mica. Syenite is a rock similar to granite, but in this rock the mica is replaced by the mineral hornblende, &c. While all classes of trap and Silurian rocks may be looked upon as containing the minerals felspar and hornblende, nevertheless these formations are of great variety, and have many minerals in their composition.

But besides such rocks there are large mountains and tracts of country, which, strictly speaking, are composed of one mineral; but these vast accumulations are also called rocks. As, for example, carbonate of lime (limestone) is a mineral; and sandstones, old and new, are simply the mineral quartz. These are, of course, not pure—the sandstones have generally a small portion of lime, oxide of iron, and alumina; and the limestones have also a small trace of iron oxide, silica, and magnesia; but both are deficient in many of the necessary mineral ingredients required by sheep. The constituents contained in four of the minerals that are common in rocks are given in Bakewell's "Geology" as under:—

	Quartz.	Felspar.	Mica.	Hornblende.
Silica, .	98	67	47	42
Alumina,	2	18	22	12
Magnesia,		...		3
Lime, .		2		11
Potash,		12	14	...
Oxide of iron,		1	15	30
Oxide of manganese,			2	1
Water, . . . .				1
	100	100	100	100

It is necessary to mention that there are different minerals commonly classified under the name of felspar, which mineralogists distinguish by the names of orthoclase, albite, oligoclase, and labradorite; and there are at least two sorts of mica, and two of hornblende. And, to show that there are varieties of felspar, mica, and hornblende, we give their composition as found by Dr Anderson:—

	Labradorite Felspar.	Magnesian Mica.	Basaltic Hornblende.
Silica, . . . . .	54·67	42·65	42·24
Alumina, . . . . .	27·89	12·96	13·92
Peroxide of Iron, . . . . .	·31	...	...
Oxide of Manganese, . . . . .	...	1·06	·33
Lime, . . . . .	10·60	...	12·24
Magnesia, . . . . .	·18	25·75	13·74
Potash, . . . . .	·49	6·03	...
Hydrofluoric Acid, . . . . .	...	·62	...
Protoxide of Iron, . . . . .	...	7·11	14·59
Soda, . . . . .	5·05	...	...
Water. . . . .	...	3·17	...
	<hr/>	<hr/>	<hr/>
	99·19	99·35	97·06

Besides, there are a variety of other minerals diffused through these formations termed zeolites, most of which contain these useful substances. Also much of their silica is in a soluble condition. When in this state it induces a decomposition of the rock, and makes it very valuable to the plants grown upon such soils as are formed from them.

There are also large tracts of rocks known to mineralogists as gneiss, mica-schist, &c. These formations may be looked upon as closely allied to granite, as they often pass into each other. The analysis of a granite and syenite rock, when the minerals are ground together, will suffice to show the nature of these plutonic formations :—

(Gray.)

	Granite.	Syenite.
Silex, . . . . .	74·84	74·84
Alumina, . . . . .	12·80	9·79
Potash, . . . . .	7·48	6·78
Magnesia, . . . . .	·99	3·76
Lime, . . . . .	·37	2·76
Oxide of Iron, . . . . .	1·93	...
Protoxide of Iron, . . . . .	...	1·46
Oxide of Manganese, . . . . .	·12	...
Protoxide of Manganese, . . . . .	...	·04
Fluoric Acid, . . . . .	·21	·03
	<hr/>	<hr/>
	98·74	99·46

The great variety of trap rocks embrace a large number of minerals which are of various compositions; but generally they contain more or less of all the principal ingredients required for the maintenance of plants. The following are the analyses of clay-slate and basalt rocks :—

	(Dr Anderson.)	(Hodges.)
	Clay-slate.	Basalt.
Silica, . . . . .	60·03.	53·70
Alumina, . . . . .	14·91	25·41
Lime, . . . . .	2·08	4·55
Magnesia, . . . . .	4·22	1·37
Potash, . . . . .	3·87	...
Oxide of Iron, . . . . .	8·94	8·95
Water and Carbonic Acid, . . . . .	5·67	4·30
	<hr/> 99·72	<hr/> 98·28

A gravelly soil, consisting chiefly of fragments of syenite and trap, and the deposit from a river which has its course over a greywacke formation, was found to contain the following minerals:—

	(Johnston.)	Gravelly Soil	River Deposit.
Insoluble Silicious Matter, . . . . .		85·76	81·68
Alumina (soluble in Acids), . . . . .		3·42	1·65
Oxides of Iron, . . . . .		4·75	3·43
Carbonate of Lime, . . . . .		·60	6·86
Carbonate of Magnesia, . . . . .		2·59	1·82
Sulphate of Lime, . . . . .		Trace	·32
Alkaline Salts, . . . . .		·76	·80
Organic Matter, . . . . .		1·91	2·92
		<hr/> 99·79	<hr/> 99·48

There is also in these rocks, both trappean and granitic, more or less of a variety of other minerals diffused or existing in veins through them, such as *vivianite*, and *wavellite*, with *pyrites*. The two former of these contain phosphoric acid, while the latter contains sulphur.

The limestone formations may be represented in their composition by an analysis of the upper chalk and mountain limestone. At the same time it must be remembered that these calcareous rocks vary very much in the proportion of lime they contain, to the extent of nearly 50 per cent. Many of them, however, contain fossils, which are useful in supplying phosphoric acid to the soil.

	(Sibson.)	Upper Chalk.	Mountain Limestone.
Carbonate of Lime, . . . . .		97·20	96·35
Magnesia, . . . . .		·06	2·28
Alumina and Oxide of Iron, . . . . .		1·05	·67
Phosphoric Acid, . . . . .		·04	.
Potash, . . . . .		·17	...
Soda, . . . . .		·02	...
Silica—soluble and insoluble, . . . . .		...	·70
Clay and Insoluble Matter, . . . . .		1·46	...
		<hr/> 100·00	<hr/> 100·00

The Old and New Red Sandstone formations have also different compositions, but only to the extent of a few per cent., their silica or quartz ranging generally from 94 per cent., the remainder being mostly oxide of iron, alumina, and lime. The herbage that grows upon these different formations must of necessity vary in quality. Where all the necessary elements for the plant exist, the herbage is healthy, and the sheep fed upon it are also in the same healthy condition; while the same plants, growing upon a different formation, where some of the necessary inorganic elements are wanting, will be stunted in growth, and the sheep feeding upon them will have to endure great fatigue and labour to collect a sufficient quantity of food for their sustenance, and will, therefore, not be possessed of stamina.

When sheep have to feed upon grass which does not contain all the earthy matters required, they will become poor in quality and predisposed to disease. Of course I do not refer to the artificial supply of turnips. When sheep do not receive the required nourishment from the herbage, they may have it supplemented by these roots, as they supply almost all that sheep require. A plentiful supply of ryegrass and clover will have the same effect, which the following analyses of their ash will illustrate :—

	(Wilson.) Turnip, whole Plant.	(Wilson.) Ryegrass, in Flower.	(Sibson.) Clover, Leaves and Stems.
Potash, . . .	28.65	12.45	24.928
Soda, . . .	5.41	3.98	3.039
Magnesia, . .	3.09	2.23	12.176
Lime, . . .	23.27	9.95	34.908
Phosphoric Acid, .	9.29	6.34	7.352
Sulphuric Acid, .	12.52	2.82	3.718
Silica, . . .	.86	59.18	1.313
Peroxide of Iron, .	.86	.78	1.470
Chloride of Sodium, . {	16.05 } As Chlorine }	2.27	11.096
	100.00	100.00	100.000

I have already referred to water for drinking. When it flows over or through such rocks as limestone or the sandstone formations, there will be a deficiency in some of the salts; but in passing over or through soils composed of the debris of trap, or other primary rocks, it is more valuable for animals. For example, one gallon of water which passed over a formation where the lower transition rocks predominate, was found to contain 14.77 grains of solid matters per gallon, composed of the following earthy matters :—



(Johnston.)

Organic Matters,	.	1.75
Potash as Sulphate, .	.	1.68
Sulphate of Lime, .	.	.64
Carbonate of Lime, .	.	5.28
Carbonate of Magnesia,	.	1.00
Chloride of Magnesium,	.	1.82
Oxide of Iron, . .	.	.56
Sulphuric Acid, .	.	1.44
Chlorine, . . .	.	.36
Silica, . . . .	.	.24

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14.77

Water of this quality would be a source of nourishment for sheep, if the herbage they fed upon was deficient in any of these earthy constituents. But even such water should be used fresh, or what is termed in a living state, as it must have been observed by practical stockmasters that, when their cattle are allowed to drink at springs coming from such rocks as are here referred to, they thrive better and have more vitality than when they are watered at pools where the water lies stagnating. This difference may be caused probably by the organic matters present exerting, in such circumstances, a baneful effect, either upon the salts of the water, or by the sheep taking into their system organic compounds, which act injuriously upon their health.

It is apparent from these observations that the geological formation of a country is an important consideration for the sheep farmer, because, in a great measure, soils take their character from the nature of that formation; and the composition of the soil determines the quality of the herbage. I here give analyses of three soils, from different formations, which speak for themselves:—

	(Johnston.)	(Sibson.)	(Sibson.)
	Igneous Formation.	Calcareous Formation.	A Sandy Soil.
Organic Matters, . .	26.86	6.33	1.49
Oxide of Iron, . . .	4.37	9.31	2.50
Alumina, . . . .	2.44		
Lime, . . . . .	...	...	.01
Carbonate of Lime, .	2.26	54.56	...
Magnesia, . . . .	.70	Trace	Trace
Alkalies, Potash and Soda	1.41	1.03	...
Sulphate of Lime, .	.11	Trace	...
Soluble Silica, . .	.84	...	...
Insoluble Silicates, .	60.47	28.77	96.00
Phosphoric acid, . .	...	Trace	...
	<hr/> 99.46	<hr/> 100.00	<hr/> 100.00

The first contains nearly all that is required for a healthy plant; the other two do not, more especially the sandy soil, which is very deficient in many of the necessary ingredients;

and any plants that might grow upon it would be quite unfit to maintain a healthy stock.

When soils have accumulated upon comparatively flat strata they are often supplemented by the debris of other kinds of rocks, and uprooted plants from higher localities, so that soils may, under such circumstances, overlie a sandstone or limestone, and, from the cause stated, may be much better than they would naturally be, and even comparatively fertile. Nevertheless, they are soon exhausted, and, if not supplemented artificially, become in a short time unproductive.

In comparing the mineral ingredients which naturally form the soils which overlie the lower transition and primary rocks, with those formed from the secondary strata, it would follow from our point of view, that sheep and other ruminating animals ought to have a more healthy constitution, when they feed upon the grass and drink of the water from the former, than when they partake of the latter; because the former soils naturally contain all the salts required for building up, as it were, the whole animal tissues; whereas the secondary rocks contain few of the flesh-forming salts which are essential in maintaining the vital functions of the animal.

In proof that the herbage and water of primary formations are better adapted for maintaining the vital stamina of animals, and enabling them to resist or throw off the germs of disease, even when an epidemic prevails, we have only to refer to Westmoreland, where the soils mostly overlie, and are formed from the Silurian and trap formations. In that county there was not a single attack of rinderpest; while in Cheshire, where the soils overlie limestone, millstone-grit, red marl, sandstone, and the coal-measures, there were not less than 55,277 attacks, and 32,284 deaths, from that disease. In ten counties in Wales, where the soils mostly overlie the older igneous formations, there was not a single case of that malady.\* It was also observed that this disease exhausted its virulence on the secondary formations in different counties in Scotland.

If further proof is required that the soils which overlie, and the water that runs over and through these primary formations, produce a better herbage for the maintenance of the health of animals, it will be found in this, that whenever soils and water do not naturally give all the necessary salts to maintain the stamina of life, through the food and water, these may be supplied by artificial means. We refer to a circumstance within our own knowledge. When rinderpest visited Dumfriesshire, the soils of which, where this disease manifested itself most virulently, are formed from secondary strata, two farmers were recommended by a friend to give their cattle daily, in their food, a

\* *Vide* Privy Council Returns for Cattle Plague, May 5th, 1866.

small spoonful of a mixture, made up of common salt, sulphur, nitrate of potash, sulphate of magnesia, phosphate of lime, with a minute quantity of either carbonate or sulphate of iron. One of these farmers treated all his cattle in this manner, and lost none, although there were nearly 200 deaths within a short distance of his farm. The other farmer gave the mixture to only a portion of his stock. This portion kept healthy, while all his other cattle caught the malady and died.

It may be mentioned that this theory of supplementing the earthy salts has been, in a great measure, corroborated in regard to the human system by Dr Lankester, who has recommended a dietetic salt, which is composed of common salt, with a little phosphate of lime, chloride of potassium, sulphate of potash and soda, with minute quantities of magnesia and iron salts. The "Chemical News" says that this is important:—"Leaving out the great portion of epidemics, almost all the common diseases are traceable to dietetic errors; and those that are certainly caused by a deficiency of inorganic food form by no means a small list. Scurvy arises from a deficiency of the salts of potash. Scrofula, and consumption, rickets, and softening of the bones occur when the phosphate of lime and other bases are deficient. A number of nervous disorders are caused by the want of iron. These, and many other diseases, are prevented, when a sufficiency of these ingredients is used in the food. Their proportions are made to assimilate to what are found to exist in the blood."

As to foot-and-mouth disease, which was very general on nearly all kinds of formations during 1872, it is probable that the cause of that malady was owing, in a great measure, to the abundant supply of grass, and the excessive rainfall of that year. The herbage was constantly undergoing a sort of washing or steeping process, so that much of its saline matter was removed. The grass was, therefore, not so nourishing; and the streams from which the cattle drank would have a smaller quantity of these healthgiving salts in them, being so much diluted. Besides, the animals required less water, having moisture in greater abundance in the grass. And as a proof that much of this disease was caused by a reduction of the saline salts in their food, it was observed that where sheep and other kinds of cattle had scanty pasture, and were watered at small springs proceeding from trap formations, they escaped the disease.

In regard to this malady and its prevention, a case may be mentioned which came within our own observation. There were three lots of cattle grazing in fields contiguous to each other. The owner gave two of the lots daily a small quantity of the saline salts found in animal blood, along with their cake, and not one of them caught the disease, while a few of the cattle in the intervening field were attacked. Whenever such was

observed, the farmer immediately provided this lot with food that contained a large quantity of the same salts, and no more of them became infected. In this case there were no precautions taken to remove the healthy cattle to a distance from the unhealthy. Although one of the lots had to drink of the same streamlet after it left the diseased lot, and, although some of the sound cattle were often seen smelling the diseased ones over the fence, nevertheless they all remained sound and healthy. It may not be too much to infer, that if a sufficient quantity of these saline matters had been supplied to them in the natural food or water, the effects would have been the same, or perhaps better.

I have thus shown by the analysis of soils and water, that there is a considerable difference in regard to the quantity and variety of the necessary ingredients in those soils which overlie the primary rocks, and water proceeding from the same, with those of a later formation. Consequently, except from some extraordinary circumstance, such as an excessively wet season, the herbage and water obtained on igneous formations will generally contain a sufficient quantity of saline matters for the support of the animal system. Hence sheep and other kinds of cattle reared upon grass grown on such soils, will have a better constitution than those fed on grass grown upon soils that are destitute of many of their necessary saline salts.

It is thus that the nature of the geological formation of a country becomes a most important consideration on the part of the stockmaster. And, as the primary formations have generally all the necessary mineral elements required for the various organs of the animal, such formations should be the best for producing a healthy herbage. There are, however, formations which do not contain all the elements required, and, where these exist, it becomes the duty of the stockmaster to ascertain distinctly the nature of the soils and water where his flocks feed, so that, wherever and whenever there are any deficiencies in any portion of the necessary ingredients, he may at once take means to supply them, so as to maintain his flocks in a healthy condition.

Although it is not known what the force of life really is, yet it is known what is required for its maintenance. Indeed, nature supplies this knowledge, having given us the type of what constitutes proper animal food in the article milk, which is found to contain all the mineral constituents required by the animal. And these, again, must be imparted to the animal in the food and drink it receives after it ceases to live upon milk. If the constituents of the animal are not obtained by the natural process, they must be supplied by man directly as salts, or through a different kind of food. Indeed, the flockmasters of the present day should follow the advice of Solomon:—"Be thou at to know the state of thy flocks, and look well to thy

herds," and "Prepare thy work without, and make it fit for thyself in the field, and afterwards build thine house."

I may state, in conclusion, that I am fully convinced that the influence of geological formation in regard to the health and growth of sheep and other cattle is of great and even primary importance, and a matter which should be thoroughly studied by all parties who depend directly or indirectly upon the productions of the soil. For, it is only by having a correct knowledge of the ingredients contained in it, that the stockmaster and cultivator can be properly guided in their professions. If aid is required, it is for them to know what is necessary, and how to apply it.

From all I have learned by studying the elements of science, and from what I have experienced and seen in the practice of neighbouring farmers and stockmasters, I am more and more convinced that it is upon the proper study of the composition of the materials of soils on which herbage grows, and the nature of the salts held in solution in the water which runs through the different formations, that success in farming and stockbreeding depends. And, as an important object of study towards this end, the stockmaster and cultivator should have a knowledge of geological formations, and should be intimately acquainted with the sciences of geology, mineralogy, and chemistry. When farmers and stockmasters acquire this knowledge, they will no longer be groping in the dark, or acting by mere customary rule, but will be intelligently guided to the proper application of whatever aids are required, under all circumstances in which they may be placed.

## ON THE CONIFEROUS TREES FOUND IN THE FORESTS OF CALIFORNIA.

By J. E. BROWN, Craigmill, Stirling.

[*Premium—Five Sovereigns.*]

THERE IS, perhaps, no one part of any country in the world, which for variety of specimens and the grandeur of their dimensions is equal to California in its forests of coniferæ. Our pine-tums and pleasure grounds contain many valuable and beautiful species from these, and from the suitableness of our climate and geological formations, many of these have already proved of importance in our home plantations. Hitherto, however, our knowledge (from difficulty of access) of the peculiar situation, soil, and aspect in which each kind of tree is found to thrive best in its native country, has been very limited, and, indeed, uncertain; but now that the country is being opened up by railway and other civilising means, this is being gradually extended, and therefore better understood. Any information on

the points of situation, soil, and aspect, however small, must be of interest and importance to arboriculturists, and as, during the last two years, I have had occasion to journey through California from north to south, I had ample opportunities of observing the different kinds of trees growing in their native state. I therefore propose to add my mite of information on the subject, and shall do so by taking up each tree under its own head, showing, from observations taken on the spot, the peculiar state or conditions in which I found it growing.

I shall take up the trees under their different Genera, beginning with the pines.

*Pinus radiata*, or the Radiated Coned Pine.—This tree I found growing well in a poor sandy soil on the sea-coast. It seemed to do well on an almost sterile soil, and is evidently well adapted for planting on exposed situations on our coast, as, at Monterey, about 250 miles south of San Francisco, it is found growing down to the beach in clumps by itself and not generally intermixed with other kinds of trees. The heights of those I saw were from 80 to 120 feet. The cones seemed to range from 5 to 7 inches long and about 3 inches broad. It is a beautiful branch-spreading tree; the timber is hard and durable, and is used for various purposes.

*Pinus macrocarpa*, or Coulter's Pine.—This is a plentiful tree in California, and I found it in various parts of the country as I went along, but chiefly at high elevations among the mountains. It is also got on the foot-hills near the sea-coast. The cones I saw were large and massive-like, being from 12 to 14 inches in length and 5 inches in diameter at the broadest part. The trees ranged from 70 to 120 feet in height, with diameters averaging  $2\frac{1}{2}$  feet at arm's height from the ground. I found it growing well on poor sandy soil in different situations.

*Pinus ponderosa*, or the Heavy-Wooded Pine.—A tree of grand dimensions and fine appearance, which I found attaining its greatest size and healthiest condition in deep stiff soil on the flat low-lying banks of rivers, but at the same time dry. It is a beautiful tree in its native state, and is generally found clear stemmed for a long way up. The specimens I saw were of various heights and dimensions, but on an average ranged from 80 to 90 feet in height, and from 3 feet to  $4\frac{1}{2}$  feet in diameter, with cones 3 inches long and  $1\frac{1}{4}$  broad.

The timber of this tree is said to be of excellent quality, and from its being comparatively free of branch knots, is easily manufactured.

*Pinus Benthamiana*, or Bentham's Pine.—This magnificent tree I generally found growing in districts by itself and not intermixed with other kinds; at times, however, it is got growing along with others, but not often. It is thus found in various parts of

California both north and south, on the sea-coast ranges and in the Sierra Nevada Mountains, at various altitudes—all seemingly doing well. There are some fine masses of it to be seen on the mountains some way south of San Jose, on the stage road from San Jose to Monterey, and on the hills lying east of the town of Humboldt. The specimens I saw were, some of them, over 250 feet in height, with diameters of 9 feet. The cones were from 4 to 6 inches long and 3 inches broad. The soil on which I generally found this tree growing was of a poor, sandy character, and the situation rather exposed.

The seeds of this tree are sold in San Francisco at 32s. per lb.

*Pinus Jeffreyi*, or Jeffrey's Pine, I found growing on a very poor soil at various altitudes, but chiefly on what, in California, are called the foot-hills—being the lower range of mountains. It seems to thrive best in comparatively sheltered situations, but at the same time I have seen it growing to a good size in rather exposed places. It is not generally found over California, but in spots here and there—particularly north of San Francisco. Some specimens I saw ranged from 100 to 160 feet in height, with diameters of from 2 to 3 feet, and with cones 7 to 8 inches long, and 3 inches or more broad.

*Pinus Parryana*, or Gambier Parry's Pine.—This tree is found along the line of the Union Pacific Railway, where I saw it growing in the gorges, and on the hill sides of the Sierra Nevada Mountains as we passed along. I found it both in warm and exposed situations, but almost always on poor soils, at least on soils of a sandy and dry nature. The cones ranged from 4 to 6 inches in length, and 2 inches in width.

*Pinus insignis*, or the Remarkable Pine.—This is a Pine which I found growing in rather low altitudes, and in comparatively warm situations. I have found it in the valleys and foot-ranges of the mountains in various parts of the country. When standing out alone, and free from encumbrance, it forms a beautiful tree, with branches spreading to the ground. The specimens seen were from 70 to 120 feet in height, and from 2 to  $3\frac{3}{4}$  feet in diameter, with cones 3 inches long and 2 inches broad.

Seeds sold in San Francisco at 60s. per lb.

*Pinus Sabiniana*, or Sabine's Pine, I found growing in high altitudes on a poor sandy soil on the slopes and tops of mountains, and in rather exposed situations. It is generally found intermixed with other kinds of pines in these high elevations, and forming a splendid tree of about 160 feet in height, and  $4\frac{1}{2}$  feet in diameter. The trees I saw were generally branched to the ground. I have met with them in various parts of California. Their cones ranged from 7 to 11 inches in length and from 5 to  $6\frac{1}{2}$  inches in width.

The seeds of this tree can be bought in San Francisco for 24s. per lb.

*Pinus Lambertiana*, or Lambert's Pine.—This tree I found growing in the poorest of soil—composed of almost pure sand—but almost always in inland parts of the country. On the Sierra Nevada Mountains it is particularly plentiful, where I have seen it growing on the sides of ravines and in gorges, attaining a height of over 250 feet, and 10 feet in diameter. It is a tree, which, in its native state, shows its stem free of branches to a considerable height, and, being thus easily manufactured, although the timber is of a soft character, it is extensively used for railway, mining, and other purposes.

The cones of this tree are from 11 to 15 inches in length, and about 4 inches in diameter.

*Pinus Balfouriana*, or Dr Balfour's Pine, I found growing in very high elevations, on a soil of a loose, dry, stony character, and in very exposed situations. I saw it growing on the tops of the high mountains near the state line betwixt California and Oregon, where it was fully 90 feet high, and 10 feet in circumference, with cones nearly 5 inches long and  $1\frac{1}{2}$  broad. In the same district, and along with this tree, I found the Contorted Branched Pine, or *Pinus flexilis*, the latter, however, in some cases, growing at higher elevations than the former.

*Pinus tuberculata*, or the Tuberculated Coned Pine.—This is a comparatively worthless pine, attaining no great height or beauty of appearance. Even in its native state it did not appear an attractive tree, but small and diminutive looking. The timber, however, is said to be of good quality. For planting on exposed situations this is a good tree, as I observed it growing well on the sea-coast some 300 miles south of San Francisco, on a poor sandy soil.

The largest specimens I saw of this tree were about 35 feet in height, and 1 foot in diameter; with cones from 4 to  $5\frac{1}{2}$  inches in length, and 2 inches in breadth.

*Pinus monticola*, or the Mountain Pine.—I have seen this pine in high elevations in the Sierra Nevada Mountains. It seems to be found chiefly in such high elevations, both in exposed parts of the mountains and in their deep warm gorges. The soil on which I found it in its healthiest state, and greatest dimensions of timber, was of a very poor and shaley character, lying on the rock. On taking some measurements in the best way I could under the circumstances, I found a good many specimens of this tree to be over 120 feet in height, and 2 feet in diameter, with cones from 6 to 7 inches long, and  $1\frac{1}{4}$  inches wide.

*Pinus muricata*, or the Bishop's Pine.—This is a tree which I generally found growing by itself, in patches or clumps, and not intermixed with other kinds. It is thus found at various elevations and in different situations, sometimes near the sea, and at other times on the mountains inland; but generally in very



exposed situations. I have seen it doing well on different kinds of soils—sometimes on a wet mossy hollow half-way up a mountain, and again on the bare, exposed, and dry sandy side of the same mountain. It is more of a bushy character than that of a timber tree, and I have never found it more than 35 feet in height, with a stem 1 foot in diameter, with cones 3 inches long, and  $1\frac{1}{4}$  in diameter.

*Picea grandis*, or the Great Silver Fir.—This is one of the finest of our silver firs, and is really a beautiful tree when seen in its native state. When standing out alone and unencumbered with its neighbours, it presents one mass of foliage sweeping to the ground. Like our own silver fir it luxuriates in warm situations and on soils of a deep loamy character. Thus I found it at its greatest height and finest condition of timber, on the warm and sheltered banks of rivers, in the valleys among the mountains. Nowhere have I ever seen it on poor dry soil or in exposed situations. Some of the finest specimens which came under my notice seemed to be about 300 feet in height and 6 feet in diameter, with cones over 3 inches in length and  $1\frac{1}{2}$  broad.

*Picea nobilis*, or the Noble Silver Fir.—This is really a magnificent tree, and is found covering great parts of the Sierra Nevada and other mountains in California, in districts by itself, and at times intermixed with other kinds. It is generally diffused over the northern parts of the country, and is found on different soils and situations, as I have seen it growing in a healthy state both on a poor, dry soil, and on one of a deep moist character, and although found at great elevations and in exposed situations, it attains its greatest size and finest appearance in warm spots, along the confined banks of rivers, in the glens and ravines of the mountains, where the soil is of a deep loamy kind. On taking measurements of this tree, I found that on the more exposed sites it seldom attained a greater height than about 150 feet, and a diameter of 2 feet, while in the warm sheltered places it measured over 250 feet in height, with a diameter of  $4\frac{1}{2}$  feet.

The seeds of this tree are sold in San Francisco at 4s. per oz.

*Picea bracteata*, or the Leafy-bracted Silver Fir.—I met with this tree some 300 miles south of San Francisco growing on the mountain ranges a few miles inland from the sea-coast. It is found at various elevations, near the level of the sea, and some thousands of feet above it, but always attains its greatest dimensions of timber in warm situations, and on soils of a sandy loam character. The finest specimen I saw measured 130 feet in height, with a diameter of over 3 feet. It is a very straight and beautiful tree, with few branches.

*Picea amabilis*, or the Lovely Silver Fir.—A very fine tree when seen growing in its native state. I have found it in various

parts of the country, generally intermixed with other kinds, and when thus found, forming the principal tree in the forest. It is found on the mountains at pretty high elevations, and both in warm and exposed situations; but, as is generally to be found in such cases, the best specimens as regards timber are to be found in the warm gorges or ravines, where the soil is kept moist from the heights above. The soil where I saw this tree growing was of a loose gravelly character. Some of the specimens which came under my notice were about 250 feet in height, with diameters of nearly 6 feet.

*Abies Douglasii*, or the Douglas Fir.—This fine-looking tree is now well known in this country; but, although we have got some nice specimens in our pleasure grounds, but a poor idea can be formed from them as to what this tree is in its native state. When in its most favourable situation, and unincumbered with other trees, it presents an impressive appearance: of a great height and beautiful proportion of stem, the branches sweep to the ground, forming one grand mass of foliage.

This tree is found generally diffused over the Pacific slope of North America, forming large forests in parts, and intermixed with other kinds generally. In British Columbia and Oregon its timber forms the chief export trade of these parts of the country. There they grow to a great size—being from 10 to 15 feet in diameter, and 300 feet in height. The specimens I saw in California measured over 200 feet in height, with diameters averaging 5 feet. I always found it in warm situations, although I believe it also grows in exposed places at high elevations. When growing on the high exposed mountain sides it only forms a small tree, and the fine large specimens are only to be found in the valleys, where the soil is of a deep rich character and the situation warm.

Seeds sold in San Francisco at 10s. per ounce.

*Abies Menziesii*, or Menzies' Spruce Fir.—A thickly-branched cone-shaped tree when standing out alone and unincumbered by other trees. I found it growing in different parts of California, and, from my notes, I find that it luxuriates in deep rich soil of a rather dampish character, and is consequently found in its best state, both as regards dimensions of timber and beauty of appearance, on the banks of rivers and in the valleys among the mountains. In its most favourable conditions I found it attaining a height of over 100 feet, and from 2 to 4 feet in diameter.

*Abies Mertensiana*, now generally known as *Abies Albertiana*, or the Californian Hemlock Spruce Fir.—This tree I found in large quantities among the mountains of California. I found it forming the principal tree in vast forests covering the valleys and mountain sides to comparatively high elevations, on soils both of a deep rich character and that of a poor sandy nature.

Some specimens which came under my notice measured over 180 feet in height, and 6 feet in diameter.

*Abies Pattonii*, or Patton's Giant Californian Fir.—I found this tree growing at various altitudes and in different situations—sometimes in fine warm places in gorges and in valleys bordering rivers, and at other times in very exposed situations high up on the mountain-sides, but always with a marked difference in respect of size and general appearance,—in the former attaining a height of 180 feet and 6 feet in diameter, with a healthy and beautiful appearance; while in the latter case, the trees were invariably of a poor and stunted character, seldom attaining a greater size than that of a bush. From this, therefore, I am led to conclude that this tree, in order to do well, requires a warm situation and a soil of a deep rich character.

*Cupressus Lawsoniana*, or Lawson's Cypress.—In journeying along the line of the Union Pacific Railway to San Francisco, I came across this tree in different valleys in the Sierra Nevada Mountains. It is a magnificent tree in its native state, both as regards dimensions of timber and general appearance. I observed that it is invariably found growing in warm and sheltered places along the banks of rivers, in the valleys bordering these, and on the sides of ravines and gorges; but never have I seen it in any very exposed situation. Consequent to its peculiarity of warm situation, we find that it is characteristic of a deep loamy soil of a dampish character. I have seen specimens of it about 150 feet in height and 3 feet in diameter, with the branches sweeping in a regular form from top to bottom. In one case, when on the railway, when passing through a clump of this cypress, the branches of the trees near at hand came sweeping down so near that I was enabled to grasp a branchlet from the carriage window. I observed that numerous saw-mills have been erected by the Railway Company in the best timbered parts of the Sierra Nevada Mountains, and that the timber of this tree is cut up by them for the purposes along the line.

Seeds sold in San Francisco at 48s. per lb.

*Cupressus macrocarpa*, or Lambert's Cypress.—I came across this fine tree in different parts of California, but particularly in a district some way south of San Jose, near the sea-coast, and within sight of the stage-road running south to Monterey. There I saw it growing in the hollows and on the sides of the mountains, both in warm situations and in exposed ones, and in wet and dry soils of different characters, all seemingly doing well. On taking an average of a few, I found their height to be about 50 feet, but one fine specimen I came across measured 65 feet in height, with a stem nearly 3 feet in diameter.

Seeds sold in San Francisco at 40s. per lb.

*Cupressus Goveniana*, or Gowan's Californian Cypress.—This is

a mere bush, which I found growing in the same district as *C. macrocarpa*, but nearer to the sea-coast. It is seldom above 12 feet in height, and grows on different kinds of soils,—both rich and poor,—and in warm and exposed situations.

*Cupressus attenuata*, or the Slender-branched Cypress.—This cypress is also a mere bush of about the same height as the last-named one. I invariably found it growing in nice warm situations, and in soils of a deep rich character, rather inclined to be moist.

*Cupressus M'Nabiana*, or M'Nab's Cypress.—This is another bushy cypress, of about the same height as the two last ones. I found it at high elevations among the mountains, and in various kinds of soils.

Seeds sold in San Francisco at 4s. per ounce.

*Sequoia sempervirens*, the Red Wood, or Bastard Cedar.—This is the grand timber-tree of California. Its timber is of a light red colour, resembling mahogany very much, and is manufactured into all shapes, and for various purposes. I found the tree growing generally all over California, and forming the principal crop in different parts. I observed it in great abundance in the Sierra Nevada Mountains, and particularly so at the "Cape Horn" part of the Union Pacific Railway, where a large saw-mill has been erected by the company for the manufacture of this and other kinds of trees into railway sleepers and other purposes of the line.

It forms a fine-looking tree in its native state, and I have seen specimens of it over 300 feet in height, and 8 feet in diameter. The soil on which I saw it growing most luxuriantly was of a loose gravelly character, on the banks of a ravine where it was watered from the heights above. It, however, seems indigenous to moist soils and situations.

The seeds of this tree can be bought in San Francisco for 40s. per lb.

*Sequoia gigantea*, or the Wellingtonia.—So many descriptions of the conditions under which this tree is found growing in its native state have been laid before the public by parties who have visited the district where it is found, that I consider it unnecessary for me to say anything regarding it.

*Thuja Menziesii*, or the Menzies Arbor Vitæ, I observed growing generally on deep rich soil of a dampish character, on the sides of rivers, and in valleys bordering these; and seldom on very poor or dry sites. It is a fine-looking tree, growing about 60 feet in height, and clothed to the ground with wide-spreading branches.

Seeds sold in San Francisco at 6s. per ounce.

*Thuja gigantea*, or the Gigantic Arbor Vitæ.—I found this tree attaining its greatest dimensions of timber, and its finest

appearance generally, on a soil of a deep loamy nature, rather moist, but at the same time not what might be called wet. I have observed it, however, of a very fair size on a soil of a sandy porous character ; but in this case the soil was kept dampish by water from above. As a rule this tree thrives best on the banks of rivers, where the soil is moist and the situation sheltered. The largest specimen which came under my notice measured 130 feet in height and 4 feet in diameter.

### ON SUCCESSFUL PLANTING EXPOSED LAND.

By ANDREW GILCHRIST, Forester, Urie, Stonehaven.

*[Premium—Five Sovereigns.]*

If the many agricultural improvements that have taken place in Scotland during the past century were examined, it will be found that arboriculture has played an important part both in increasing the productiveness and keeping up the increased fertility of the soil. A careful inquiry into the influence of arboriculture will prove that it has been and is still one of those subsidiary rills that have helped to swell the river of success, that has attended the efforts put forth by many of the agriculturists of our day, not only to improve and fertilise the soil, but also to ameliorate the climate. Even in the most fertile parts of the country the influence of woodland is doing much to benefit agriculture. The work is so quietly performed, that even those who are reaping the benefits of their influence fail to observe or appreciate them, but let the trees be suddenly removed, and they would not be so slow to acknowledge the injuries that their absence was capable of producing. But the beneficial influence of plantations is more apparent in those districts where the land has been but recently reclaimed. The soil of all newly reclaimed land is left in a loose and open state, and this, along with the draining off of the surface water makes the soil more liable to suffer from drought, and without shelter the moisture is easily evaporated, and it soon becomes dry through the effects of scorching winds and the sun's heat, and at best it yields but a meagre crop. But when such land is sheltered by plantations, the wind is softened, and thus the soil is kept in a moist state, and is not so easily parched by the wind. The crops braid earlier, and more regularly, and throughout the whole season they continue to maintain a more luxuriant appearance, and ultimately it yields a greater quantity and a much finer quality of grain. With regard to a crop of grass or turnips the result is the same, the produce per acre is invariably larger, and

their nutritive qualities are greater. Under the influence of judiciously laid out plantations the wind is softened and disarmed of its blighting influence, and consequently there is a greater degree of that genial warmth, both in the air and in the soil, which is so essential to vegetation. A great part of the nutritive food of plants is drawn from the air and from the gases that are evaporated from the soil, consequently a cold withering wind sweeping over a district, instead of accelerating the formation of dew and increasing the latent heat of the earth, or promoting the evolution of gases, does the very opposite, neutralising the effect of the sun's heat, and lowering the temperature of the soil. When grazed under a suitable shelter cattle are less liable to suffer from many of those diseases that are known to result from exposure in a trying and changeable climate; they also thrive better and fatten much faster, because there is a less proportion of their carbonaceous food required to keep up the necessary animal heat. But without a sufficient shelter the animals require more labour to procure the necessary food; and instead of it being all available for fattening, a great quantity of it is consumed in keeping up the animal heat.

Successful planting on bleak exposures helps greatly to fertilise and develop the resources of even the poorest land; as soon as the trees have grown so high as to let their influence be felt, it becomes quite apparent that both the soil and climate are gradually undergoing a change as the shelter extends. The very heather is seen to get less luxuriant, and eventually to give place to a grassy herbage; and the more extensive the tract of land becomes over which the warmth and shelter is effectually felt, the natural herbage becomes more succulent and nutritious, and the farmer is able to keep a more numerous and much finer breed of stock on the same land.

This brief summary of the benefits that follow the successful planting of bleak exposures, proves clearly that the success must be partly estimated by the lasting nature and value of the shelter that is afforded to the crops and stock by the proximity of plantations; and shows how very important it is to plant those trees that will provide and continue to maintain a permanent shelter.

The plantations which we are about to report are situated in the county of Renfrew, and consist of several enclosures formed primarily for shelter. The average altitude is about 900 feet above the sea-level; the exposure is mostly north-west by west. The most of the ground is very steep slopes, with bare whinstone rocks protruding. The distance from the sea is eight miles, and except adjacent to the coast, the tract of country that lies between the sea and the plantation consists chiefly of a moorish and very bleak tract of land, quite treeless, and indeed almost

destitute of any natural shelter. The prevailing winds of the district are from the south-west, and their force is rather increased than abated during their passage through this bare district, and they fall upon many of the more exposed parts of those plantations with very great force. The soil consists of a coarse brown earth, with a mixture of stones; for the most part it is a dry light soil, formed chiefly by the gradual disintegration of the rocks that lie underneath and around it. The depth of the soil varies considerably; in some of the chinks and corners at the foot of the perpendicular rocks, where the soil has evidently accumulated as it loosened and fell from the higher ground, there is a fair depth, but the average depth is not more than three inches, resting for the most part on a rotten and decaying quality of whinstone rock. In several places it is incumbent on very hard whinstone rock, with but few fissures in its surface. On the lower parts of the ground, where the rock is at a greater depth, the subsoil consists of a very coarse brown gravel. There are also several portions with a mossy soil resting on a subsoil of clayey gravel, and these are almost the only parts that required draining. There are six enclosures of various extent all planted at various periods subsequent to 1821, but owing to injudicious planting, especially on the more exposed parts, of trees that were unable to withstand the effects of the cold cutting winds, the plantations became dilapidated, and the ground had to be cleared in 1860 and 1861, and judiciously replanted. The first crop consisted chiefly of larch, with a number of Scots and spruce firs, and a few of the more common sorts of hardwood trees put in at irregular distances over the ground; but with the exception of the larch, there was not anything like a sufficient number of trees to form a permanent crop. The work of clearing this crop and replanting was performed by the reporter, and thus by a careful observation of the habits of the various trees, and the effects produced on them by the severity of the cutting winds, enabled him to form a pretty correct estimate of their respective capabilities for planting on bleak exposures. The plantations that had to be cleared were from eighteen to forty years planted, and from two to thirty acres in extent. The first cause of these plantations becoming unhealthy and dilapidated was doubtless owing to the trees that were planted on the outside of the most exposed margin of the plantation being unable to withstand the severity of the position. These consisted for the most part of the spruce fir (*Abies excelsa*), a tree which, though of a dense branchy habit, and apparently well suited to provide a permanent shelter, is so tender that it is quite unable to withstand the severity of the wind on the more exposed parts of plantations, especially when the soil is thin and light. At a very early stage of their growth almost every one of

them on the outside zone had succumbed to the withering blast; many of them, sheltered by the nature of the ground, or by the dyke that enclosed the plantation, continued to keep up a green appearance on the lower part of their stems after the branches on the upper parts had become quite withered and dead, and their whole aspect bore unmistakeable evidence, that after they had grown on an average for ten years, and got fairly above the natural shelter of the district, they had gradually become less vigorous in their growth. It was only on the least exposed side of the tree that branches had been formed, and even these had an open and bare appearance, the leaves, which were mostly in tufts at the points of the branches, were very short, and had a withered and brownish tinge about them. These unhealthy appearances were the same throughout the whole plantation. Wherever the trees had grown so high as to be fairly exposed to the uninterrupted force of the wind, they seemed to be affected in their growth in proportion to their exposure. Another defect in the spruce for an outside tree on bleak exposures is, that it is a very shallow-rooted tree, and is ever most liable, even when in a moderately healthy state, to be uprooted by the wind. This had been a very frequent occurrence, not only on the more exposed parts, but throughout the interior of the plantation. On the dampish portions of the ground, where they were brought up from the first under a suitable shelter, the spruce had grown into profitable trees; but altogether the size and health depended on the depth of the shelter that was between them and the wind; and gradually, as the shelter became opener, the spruces were invariably the first trees to succumb to the change.

There were also several portions of the most exposed margins planted with larch, and though it is naturally a hardier tree than the spruce, it had not much more effectually withstood the effects of the wind. When compared with those that grew on the more sheltered parts the rate of growth had been much slower, and altogether they had a very unhealthy and stunted appearance. Their branches were short, twisted, covered with spray, and generally dead at the extremities; their stems were much clad with mosses and lichens, and considerably bent before the wind, with no leading shoots, the tender growths being apparently cut off by the severity of the cold blast. Many of those on the most exposed margins were quite dead, and all were considerably affected by the rot. The farther they were removed from the exposed side, even though the soil was poorer and more elevated, the benefits of shelter became more and more apparent in proportion as they were sheltered, so did the symptoms of tenderness disappear; the trees gradually becoming healthier, stouter, taller, and quite free from rot. In fact, where the trees had been moderately sheltered, and timeously and judiciously



thinned, the timber was not only quite sound, but of a superior quality; and the quantity produced per acre would favourably compare with that produced on better soils and situations.

There were a few trees of the silver fir on the exposed margin of one of the plantations, and these had withstood the effects of the storm much better than the spruce, and fully as well as the larch. The silver fir takes a deep hold of the ground, and its foliage does not get so brown and unhealthy as the spruce, and the branches continue to grow and extend even on the exposed side of the tree. Another good feature in this tree is, that though it loses its leader, it very soon forms another; consequently, though the upper part of the tree is cut off by the wind, it readily sends out another shoot lower down the stem. Thus, so long as it lives, it prevents a break from occurring in the outside row.

Beyond all question, the Scots pine is the best tree in every respect for bleak exposures and thin soils. If they are allowed sufficient space in which to develop themselves, and inured to the free play of the winds, only in exceptionally severe hurricanes are they uprooted. This was abundantly demonstrated in these plantations. Wherever there was a Scots pine on the outside row, it was quite healthy, and showed no signs whatever of suffering from the severity of the exposure; but where they had been brought up for a time under the shelter of the spruce or larch, they were liable to be easily overturned by the wind. This was doubtless caused not from a natural tenderness, or from any defect in the tree, but because they had not been from the first individually accustomed to the full force of the wind.

Amongst the hardwood trees, the elm, where severely exposed, had proved the most unsuitable tree, not a few of them being quite dead in the top; and as a general rule, they seemed unable to resist the force of the blast, so far as to be able to grow up in anything like an upright direction, both stem and branches being much bent and growing away from the wind. Many of them were quite rotten and worthless. The ash was apparently much better suited for the exposure, and had withstood the effects of the blast better than the elm; it had continued to maintain a more upright direction of growth, and apparently, if judiciously reared, it was not altogether unsuited for becoming a moderately profitable timber tree. The oak was of very slow growth, its stem being much covered over with spray, and though they continued to live on the exposure, none of them had the appearance of growing into anything like a timber tree. The beech, naturally a hardy tree, did not withstand the force of the wind on the more exposed parts. It had sent out most branches from the least exposed side; and though it maintained a healthy appearance, yet, owing to the way in which the branches grew and extended out, chiefly from the least exposed side, it was not

altogether a suitable tree: the principal objection being, that it is more inclined to grow into a huge, one-sided, wide-spreading bush, its weight of branches making it liable to be uprooted by the wind. The birch had withstood the effects of the exposure fully better than the beech. Its rate of growth had not been rapid, but it continued to be healthy, and to keep up a tree-like appearance; and on the damper parts of the plantation it had proved altogether the most suitable of the hardwood trees. The alder was apparently not so hardy, numbers of them, where much exposed, being dead at the top, and all generally inclined to produce most branches on the least exposed side. The sycamore was the hardwood tree that seemed to be least affected, either in its health or form of growth, by the severity of the wind. The whole of them had a healthy aspect, and firmly withstood the effects of the storm. Though the rate of growth was slow, the trees did not incline to become so dwarfed and one-sided as the great proportion of the others did, neither were they so frequently dismembered by the force of the wind.

From these observations of the habits of the various trees on this cold and exposed situation, we inferred that the Scots pine is not only the most suitable tree to plant for a permanent shelter, but also for a profitable crop. The health and success of the larch depends to a greater degree on the extent and breadth of the plantation; and unless a shelter sufficient to soften the force of the wind be provided, it will not become a profitable timber tree on very bleak exposures. For example, the best crop of larch was produced in the plantations numbers 1 and 2, which were the most extensive and first planted, the average breadth before the wind being 250 yards. In both of these plantations the value and health of the crop was more directly controlled by the breadth of the plantation and the severity of the wind than it was by the quality of the soil. This was quite apparent, and in clearing the crop we (from measurements taken after the trees were cut down) formed the following estimates of the value of an acre on the various exposures:—1st, on the most sheltered parts the value of an acre, forty years planted, was L.55, or L.1, 7s. 6d. per acre annually, with most of the trees in a growing condition. On a less sheltered part the value was L.28 per acre, or 14s. per acre annually, with the greater part of the trees unhealthy, and much impaired in their rate of growth. An acre made up of 10 yards in breadth on the most exposed margins, was not worth more than L.10 per acre, or 5s. per acre annually, and scarcely a tree in a healthy state, many of them being quite dead. This gives L.31 as the average value of the larch per acre, while the value of an average acre of Scots pine was L.32, or 16s. per acre annually, and the trees in a healthy growing condition; thus giving a balance of L.1 per acre in favour of the

Scots pine, exclusive of the value of the shelter that the adjoining fields would have derived if the crop had consisted of Scots pine instead of larch.

The value of an acre of spruce on the most favourable soil and sheltered situation in the plantations was L.25 per acre; but on the exposed margins, where the soil was thin, and the exposure severe, it was not worth more than L.4 per acre. The value of an acre of silver fir was equal to the spruce. Of the different sorts of hardwood trees, sycamore and ash were the most valuable, the average value per acre being about L.15.

Number 3 was a belt 50 yards in breadth, thirty years planted. The value of the produce of an acre of larch was L.18, 15s., or 12s. 6d. per acre annually. The greater proportion of the trees were in a most unhealthy, stunted, and weather-beaten state, and about fifty per cent. of them had been uprooted. The Scots pines were in a growing condition, and had there been as many of them as would have constituted a crop, cautious thinning would have left a healthy growing crop of timber in the belt. The value received for the Scots pine at the time of clearing was 1s. 4d. per tree; and if we take 330 trees per acre as a fair crop at that age, it gives L.22, or 14s. 8d. per acre annually, being a balance of 2s. 2d. per year, per acre, in favour of the Scots pine, without the value of the permanent shelter being considered at all. And after say ten years more of a healthy growth, a still further addition to the value of the crop might be reasonably expected.

Number 4 was a clump, convex on the most exposed side, and concave on the other sides. The crop consisted mostly of larches, with a few Scots pines and oaks. This clump was about 250 yards broad, and thirty years planted. There were about 40 per cent. of the larches dead and uprooted, when cleared in 1861; the remainder, except a few in the most sheltered part, were quite withered, and apparently at their growth. The value of an acre on the most exposed parts was L.9, or 6s. per acre annually; but on the more sheltered parts an acre was worth L.30, or L.1 per acre annually. The value of an average Scots pine tree in this enclosure was 1s. 5d.; and if we take 330 trees per-acre as a crop, it gives L.23, 7s. 6d. as the value of an acre of Scots pines against L.19, 10s., being the value of an average acre of larches in the same enclosure. The oaks, though they continued in a growing state, had made little progress, and were evidently much stunted in their growth. They were only worth 3d. per tree.

Numbers 5 and 6 were about eighteen years planted, and both belts about 20 yards broad. The crop consisted of larch, with a few spruces on the most exposed sides. The trees had all suffered so severely from the effects of the cold wind, that there

was scarcely a living tree to be found. The market value of the larches was 2d. per tree, while the few spruces would not have paid the clearing. Contrast these two belts with other two on the same estate, and on a rather more exposed situation; they were 22 yards broad, and planted twenty-six years ago, chiefly with Scots pines and a few larches. The reporter thinned them in 1861; and as the larches had then begun to show undoubted symptoms of tenderness and decay, they were mostly removed at that time, and now (in September 1873) there is a regular crop of healthy growing Scots pines on the ground, worth at least 10d. per tree; and in all probability these trees will, when at their growth, yield a return per acre equal if not above the rent that is at present being derived from the adjoining fields for agricultural and dairy purposes, not to speak of the value of the shelter that they are affording to both stock and crops.

From these estimates, which are founded on the prices that the various trees realised, it is clearly established that the Scots pine proved the most suitable tree for the purpose of maintaining a permanent shelter, and also that, unless under exceptionally favourable circumstances, it yielded the most profitable crop. If even a belt of Scots pines, from 10 to 20 yards broad, had been formed on the most exposed side of the widest and largest plantations, a still more profitable crop of larch timber might have been realised.

When plantations are to be formed on bleak exposures for shelter, the primary aim of the planter should be to plant only those trees that have an undoubted reputation for withstanding the severity of the exposure on similar situations, and reject all those that will only thrive till they have grown above the natural shelter of the district, and then gradually succumb to the effects of the blast, as also those that are liable to be easily overturned by the wind. The consideration of whether there is likely to be a demand in the locality for the particular kinds of timber, is a matter of secondary importance, because in instances of this kind the real value of the tree is ascertained chiefly by the permanency of the shelter that it affords to the fields that come within the range of its influence.

Even though the soil of the plantation be very suitable for the growth of larch, special attention should be paid to plant about 20 yards on the most exposed margin with Scots pines, so that the wind as far as possible may be prevented from making a gap in the plantation. When the trees have reached a height of say 10 to 15 feet, the decay or uprooting of a few in the outside zone is a very serious matter.

Although the trees that are planted in the interior of the plantation are of a hardier kind, still, having received up to this stage of their growth a certain degree of shelter from the sur-

rounding trees, they are unable to overcome the suddenness of the exposure. They have been brought up under a higher temperature than the outside trees, and have been inured to the full force of the wind, consequently, when it falls with uninterrupted force upon them, they are either uprooted or gradually wither and die. Whole plantations are frequently rendered utterly useless as a shelter to the surrounding fields by the injudicious selection and planting of unsuitable trees on the exposed margin.

By planting this sheltering belt entirely with Scots pine, and where a variety of foliage is wanted, if a few sycamores are put in at from 9 to 18 feet apart, timely attention to thinning will secure a safe and lasting shelter to the plantation.

Nor is this all; for where it is found, as it not unfrequently is on thin light soils, to be most profitable to clear the crop after forty or forty-five years' growth, this outside belt of hardy trees can be left to break the force of the wind till the second crop has grown sufficiently high to be a shelter. In the case of narrow belts, the outside row of trees on the exposed side will frequently be found invaluable for lessening the force of the wind when the crop is cut over.

The clearing of these plantations was commenced in 1860, the whole of the trees being cut over, except a few hardwoods and Scots pines, which, when found at suitable distances apart, were left here and there throughout the enclosures as a shelter; not a few of them were uprooted, but what did remain, though they grew little, did much to soften the force of the wind. Ten acres of number 1 were prepared for planting in the autumn, the branches being all collected and burned, and all the damp pieces of ground were drained, the excavated soil being spread back over the ground. Planting was begun in the 1st of October, by planting a belt 20 yards broad on the most exposed side, entirely with Scots pines and sycamores, the latter placed about 12 feet apart, and the intermediate spaces filled up with Scots pine about  $3\frac{1}{2}$  feet apart. The rest of the ground, where dry, was planted with 2500 Scots pine, 800 larch, 200 spruces, with a few plants of silver fir, Austrian pine, and some hardwoods put in where the ground was suitable at proper distances apart, making the total number of plants used about 3500 per acre, the distribution being varied to suit the local peculiarities. Where the soil was thin and the situation exposed, the number of Scots pines was increased, and few larches planted; and on the best of soils and most sheltered places a few additional larches were planted and not so many Scots pines; while the dampish and mossy portions of ground were planted with 2 Scots pines for 1 spruce, no larch being used. The plants used were 2 years, 1 year transplanted larch, and small 2 years transplanted Scots pine, all from 9 to 12 inches high, and finely rooted.

It is by many considered to be most injudicious to plant immediately after removing a crop of wood, the general belief being that the ground should be left unplanted and grazed with cattle for a number of years after being cleared. No doubt this is in some cases a decided benefit, but it is not so necessary as many suppose it to be, and the success that has attended the re-planting of these plantations proves that it is not absolutely essential. The natural herbage on the ground, from which a full crop of larch was removed, consisted of the *Holcus lunatus* (or Yorkshire fog), and the *Holcus mollis* (the creeping or bearded soft grass), a species of *Agrostis*, and a thick covering of moss. This mossy herbage had grown over fallen and decaying branches, the roots of these bent grasses combining with the half-decayed vegetable substances that had fallen from the trees until a tough sward had been formed over the natural soil. This surface accumulation perniciously affects the soil and reduces its fertility, excluding to a great extent the admission of air and moisture, and the sward is of itself so dry and inert, that scarcely any coniferous plant when planted in it will live.

After planting about an acre, and observing that, owing to the thickness of the sward, the plants had to be put to an undue depth before their roots could be placed into the natural soil, and that scarcely any of them were properly firmed in the ground, we resolved to pare off the surface accumulation and lay it aside. Accordingly, before putting in the plant each planter cleared a space about 12 inches square, and when planting made sure that every plant was placed into the natural soil. It was at once apparent that this method was superior to the ordinary plan, as it caused the soil to take a better hold of the plant at the collar; thus it was made much firmer, and the cuts that had been made by the spade were quite sealed together, the action of the foot when tramping, having caused the soft earth to adhere firmly together; whereas the lightness and elasticity of the sward prevented it from being so completely compressed together as to keep the plant in a firm position.

There was a very great difference between those that were planted in the ordinary way and those planted into the soil after the surface was pared off. The former were much twisted about with the wind during the winter months; and though most of them started to grow in spring, they had a very sickly appearance, and many of them died during the summer. Those planted in the prepared soil stood the winter without any tramping, and the death rate was not two per cent. Many object to the paring off of the sward, averring that the drought is thus admitted; but after planting from 30 to 70 acres annually for a number of years, even with the extremely dry and scorching seasons of 1868, 69, and 70, observation has proved that this is inconsistent with fact.

The number of deaths per acre in any one of these dry seasons has not exceeded four, and in many cases it is under two per cent, and it was very rare to see any of the cuts that were made with the spade even slightly opened by the drought, or the plants suffering in any way from the wind lashing them, or causing them to slacken in the ground.

It may not be improper to mention, that the paring can be done at a cost of 5s. per acre, and it is a considerable advantage to the soil to have it done from three to six months previous to planting. Some years ago when doing this, we adopted an implement shaped similar to an adze, about  $5\frac{1}{2}$  inches broad in the mouth, and found that the work could be done much more efficiently, and cheaper, than with the spade. With this implement an active man should prepare 2000 places, 14 inches square, in one day.

We may also state, that the best method of putting in the plants when the surface covering is taken off, is by two cuts, made 8 or 9 inches wide in the soil, with a spade, so as to form a right angle, thus—L. The first cut must be made perpendicular, and in order to do this the planter must hold the back of the spade towards himself; and to make the other, the spade is inserted in the usual way, he then depresses and turns up the side of the spade, so as to turn up the angle of soil formed by the two cuts, the plant being drawn sharply into its place, with its rootlets below the spade, and the straight part of its root set against the perpendicular cut.

The whole of these enclosures were planted, according to the plan above described, between the autumn of 1860 and spring of 1862. There was no beating up required but on one portion, where rabbits had become rather numerous. Except the cutting away of the grass from the plants during the first three growing seasons, there was nothing else done for them, and this was only done on the more sheltered parts, where the grass cut was sufficient to pay the expense of cutting. We minutely examined this crop in September 1873, and in giving a report in regard to its appearance, it is quite apparent that the replanting has been a success. Although about the half of the total extent was planted a year later than the other, there is very little difference either in their general appearance or height, both of these being apparently more directly controlled by the nature of the soil and severity of the exposure than by the difference of one year's growth. For example, in number 4, which was planted in the spring of 1862, there are sycamores from 5 to 8 feet high, and the Scots pines on the barest soils and most elevated parts are 5 feet high, having grown 10 inches annually for the last three years; and on the best soils and situations there are numbers 16 feet high, and growing at the rate of 24 inches annually; while

in the parts of 1 and 2 that were planted the year previous, there is generally very little difference, either in regard to height or rate of growth.

The success that has attended the replanting of these woods has been beyond expectation, and an examination of the present appearance of the individual trees proves that the system of distributing the plants over the ground was absolutely essential to their successful growth. Many of the Scots pines that were planted in the autumn of 1860 and spring of 1861 have grown 16 feet high during twelve years, and are at present in a most healthy and rapid growing condition, the annual growth being from 16 to 24 inches. Many of them, on the most exposed margins, are already as high, after twelve years' growth, as some of the spruces and larches were on the very same ground after upwards of thirty years' growth. Even on the very outside row the pines are stout and well proportioned trees, and show no symptoms of impaired growth, and none of them are bent before the wind; whereas it was quite evident that, on the same parts, the trees that constituted the outside row of the former crop had begun to be most severely affected by the severity of the wind by the time they had reached the age or height of the present crop.

The larches, particularly on the thin soils and the more elevated parts, where they have come to be very much exposed to the force of the cutting winds, begin to show symptoms of disease, the branches and leading tops of not a few of them being quite dead at the extremities, and many of them are already a little bent before the wind; on better soils, and where properly sheltered, they are in a healthy thriving condition, and have all the appearance of ultimately becoming good and profitable timber trees. The average growth for the twelve years is about 9 feet, but in proportion as they are exposed so does the rate of growth and healthy appearance decrease.

Regarding the spruce, the same thing may be said. In some of the low-lying dampish spots they are upwards of 16 feet high, while on thin soils and more exposed situations they are more dwarfed in their growth; but the average growth for the twelve years will be about 9 feet.

The highest silver fir is about 7 feet high; but though the rate of growth has apparently been slow, they are healthy. The average yearly growth for the last two years is 10 inches.

The Austrian pines are growing at very much the same rate as the silver fir, the highest to be found being about 6 feet; the growth last season was 12 inches. This pine is much recommended by some, as being very hardy and suitable for planting on bleak exposures; but while agreeing as to its hardiness, we very much doubt if its dense and bushy branches do not make it



rather liable to be easily uprooted by the wind on thin soils and exposed situations.

The sycamores, planted on the most exposed sites, are in a healthy condition, and apparently not suffering in the least degree from the effects of the cold cutting winds to which they are exposed. They are all stout, well-grown trees, from 6 to 8 feet high.

There were a number of ashes, particularly on the least exposed side of number 1 enclosure, and these are from 6 to 9 feet high, and in a fair state of growth.

In the narrow belts and most exposed parts of the plantations the Scots pine is not growing rapidly, but the healthy and hardy appearance continues the same, proving beyond a doubt that it is the most suitable tree for planting on unsheltered exposures, either as a permanent shelter or a profitable crop.

After other two years' growth, the whole of these plantations will be ready to be thinned for the first time. In enclosures numbers 1, 2, and 4, there are on the best soils several portions that would now be very much benefited by a moderate thinning.

There were roads 18 feet wide left unplanted through the centres of numbers 1 and 2; and where the ground was damp a drain was cut on one or both sides, parallel with the road, and the whole of the soil taken from the drain was laid to the one side, and spread over the surface of the road. Where the nature of the ground suited, and more drainage necessary, these drains were made to serve as leaders to a number of small drains.

The damp portions of ground in any of the enclosures had not been very regularly or satisfactorily drained for the first crop of timber. Many of the drains were so shallow and crookedly laid out, that when preparing to replant we found it more advantageous to open new drains, at regular distances apart, than to clear out and deepen the old ones. In order to facilitate the removal of timber, the new drains were as far as possible laid out at right angles with the line of the plantation road, and cut from 25 to 30 feet apart; they were opened to the following dimensions—from 20 to 24 inches deep, 30 inches wide at top, the sides sloped in to 8 inches wide at bottom. The soil that was thrown out of the drains was laid on both sides, and spread back over the ground before planting. The cutting of the drains cost from 8s. 4d. to 10s. 6d. per hundred yards.

The whole of the plantations are mostly enclosed with dry stone dykes, erected at the time the first crop was planted, most of them being double dykes  $3\frac{1}{2}$  feet high, and all built of whinstone, collected and quarried on the ground. The one side of number 3, and the whole of number 4, is enclosed by a sunk fence dyke. The building of the dykes cost about six-

pence per yard; the tenants of the farms that were to be benefited by the shelter of the plantations doing the work of collecting and carting the stones free of expense.

A portion of the dyke that enclosed plantation number 1 was cleared out and rebuilt at the time of replanting, the cost being sevenpence per yard.

In connection with this report, one thing not only deserves to be noticed, but is also to be well worthy of imitation, and that is, that the farmers on the estate felt the want of shelter to their stock and crops from the cold winds so much, that they most willingly gave off several acres of ground to be planted, and continued to pay the same rent for more than one lease; and according to their own statement, the influence of the shelter added upwards of twenty per cent. to the value of their farms.

#### ON AGRICULTURAL EDUCATION; WITH SUGGESTIONS FOR ITS IMPROVEMENT.

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*[Premium—The Medium Gold Medal.]*

THE present time, when the educational machinery of the whole country is being remodelled, seems peculiarly opportune for inquiring what facilities agriculturists possess for obtaining a suitable education in those branches of science connected with their business, and for considering by what means such may be best provided. The subject is one which concerns, in about an equal degree, the interests of both landlords and tenants,—a striking connection having been found to exist between the increase in the value of land and the education and intelligence of those who cultivate it. From the exceptional educational advantages which Scotland has so long enjoyed, agriculturists in this country have been greatly superior in point of instruction to those of most other countries; and it is of importance to note that the increase in the value of landed property in Scotland has also been exceptionally great. It was shown, about three years ago, from reliable statistics produced by Government, when the Irish land question was before Parliament, that while the rental of land in Ireland had doubled during the previous hundred years, and that of England tripled, the rental of Scotland had sextupled itself in the same time. There has been, therefore, in that space of time, an increase in the value of landed property in Scotland of 500 per cent., against an increase of 200 per cent. in England, and 100 per cent. in Ireland. This is a remarkable fact; and there can be no doubt that the explanation of it is to be found chiefly in the vastly superior school system which

Scotland has possessed, and in the intelligence and enterprise which it has been the means of developing among her agricultural classes. Various secondary causes have, no doubt, exerted an influence in bringing about this remarkable development of the resources of the country,—such as the banking system, the efforts of the Highland and Agricultural Society, the system of leases, and the rational understanding subsisting between landlord and tenant; but the success of these, again, has been due mainly to the educational condition of the country; for why did not landlords find it profitable to adopt similar arrangements in the sister countries, or the tenants show any willingness to accept of them, even when offered? The subject is one well worthy of the attention of landlords, as it shows what magnificent returns may be reaped from a judicious expenditure in providing suitable education for those who have the management and cultivation of the soil.

Of late years, however, the educational superiority of Scotch agriculturists has not been maintained. While, in general education, they are apparently not inferior to those of any other country, they have been falling behind in special or scientific knowledge; or rather they have not been advancing, as those of other countries have been doing. This is a remark which applies to most other classes of the community as well as to agriculturists. In this respect, as is well known, Scotland is already considerably behind England and Ireland, not to speak of Germany and other Continental nations. If an exception be made of the science classes at the universities, which are composed principally of medical students, and of a few classes connected with institutions in Edinburgh and Glasgow, there is scarcely any such thing as the teaching of science, properly so called, or any provision for such, in the whole of Scotland. Of the grants offered for this purpose by the Arts and Science Department at Kensington, England now takes about fifteen times, and Ireland about five times, as much as Scotland; and nearly the whole of the small sum which Scotland receives is paid for the teaching of physical geography and the elements of mathematics to young pupils in connection with day schools.

*Importance of Scientific Training to Agriculturists.*—Seeing that alongside of this ignorance of science, which in too many cases seems to be bliss, there has existed for some time an exceptionally flourishing state of agriculture, some will perhaps be inclined to conclude that it would be folly to be wise in such matters. It should not be forgotten, however, that it has been by a departure from established usage, and the borrowing of assistance from science on the part of a few, and by these being imitated, more or less imperfectly by the many, that agriculture has been brought to its present state. There is a limit, however,

to the extent to which such imitation can be successfully carried; what is best suited for one farm or one field, is often by no means best suited for another; and hence it becomes desirable that every farmer should know as much of the theory of agriculture as to be able to modify the practice to suit his particular circumstances. Scientific knowledge alone, it is true, will not make a man a successful farmer; but, at the same time, in the daily advancing and artificial system of agriculture now in use, any one, without some accurate chemical knowledge, will be often placed at a disadvantage, although he may not be aware of it, and will have but little chance of being able to make the most of his circumstances. Even in so commonplace a matter as the management of the farm-yard dung-pit, the majority of farmers might derive considerable assistance from science, as much unnecessary waste is generally allowed to take place here. The conditions under which the dung heap is kept, as regards both moisture and pressure, are usually those most favourable for the decomposition and waste of the dung. Gaseous compounds escape into the air, to taint it, and to carry fertility to fields at a distance; and the valuable saline matters disengaged are allowed to be washed away by the rains to pollute the neighbouring streams; while farmers are yearly paying large sums for artificial manures to replace the ingredients thus recklessly wasted. There may, in some cases, be room to doubt whether it would pay to go to the expense of roofing in the dung-pit, to prevent the rain from falling in it; but surely this can form no reason for making the pit also a receptacle for all the rain-water off the surrounding roofs and courtyard, as is commonly done. Two-thirds, at least, of the water which usually finds its way into the pit might be excluded by the simple expedient of forming a rut round the margin of it; and the necessary degree of compression to prevent undue decomposition, might be imparted to the dung by turning the young stock into the pit occasionally for an airing. A similar waste is usually allowed to take place of the liquid manure at the farm-steading. It is usually allowed to flow, largely diluted with rain-water, through a recess, into which a few loads of earth are put once a year or so. This gets saturated in the course of a few weeks, and then the urine is allowed to run to waste into some neighbouring ditch for the rest of the year. Ashes, again, of which a considerable quantity is often produced about a farm, are generally cast into some open place, and the rain-water is allowed to run through the heap the whole season round, until the greater part of the soluble salts, upon which their value as a manure principally depends, is washed away. Were agriculturists accurately acquainted with the various ingredients which render substances useful as manures, and the way in which they act upon plants, the importance of

preventing such waste could not but force itself upon their minds; and intelligent and practical men would, no doubt, soon provide means of doing so, were they fully alive to its importance. A knowledge of chemistry and vegetable physiology would also be of no less importance to farmers, both in purchasing and applying artificial chemical manures. As numerous different compounds are now sold at different prices, it would often be of considerable importance to be able to estimate in what form agriculturists can, at the least expense, obtain and apply the particular fertilisers which they want for any crop. These manures, again, yield very handsome profits when applied in certain circumstances, and in certain ways and quantities; while, in others, their application is attended only with loss. To be able to ascertain beforehand when and how they can be made to pay, so as to be able to take advantage of them when they can be applied with profit, and avoid using them when they will not pay, would obviously be of advantage to farmers. It often happens, also, that in manuring for a certain crop, it is not necessary to supply all the ingredients which the plant requires, as there is an accumulation of some of them in the soil; and in such cases unnecessary expense might be saved, and exactly the same results produced, by supplying only those constituents of plant food in which the soil is deficient. Again, the process of subsoiling has often the effect of greatly increasing the producing power of land, often doubling or tripling it, and in some cases increasing it even to a much larger degree; while in a different field, or even in a different part of the same field, where the subsoil does not contain those ingredients, in which the upper stratum of soil is deficient, or where it contains any substance hurtful to vegetation, and sufficient care is not taken to neutralise it, the labour will not only be lost, but the soil may be materially injured for years to come. If, therefore, any one fails to have recourse to subsoiling or artificial manuring, when such can be done with profit, he is evidently neglecting to make the most of his opportunities; and if, on the other hand, he has recourse to either in circumstances in which it will not pay, he is incurring a loss which he might have been able to foresee and prevent. To be able to ascertain beforehand, with some degree of accuracy, when these operations can be had recourse to with profit, would evidently be of considerable use to farmers; but this can be done only by a chemical examination of the soil, or by experiment. The experience of others upon other farms, where the circumstances, although apparently similar, may be considerably different, is a very unsafe guide to follow. To conduct the necessary experiments, however, a knowledge of chemistry and vegetable physiology is necessary; for without this the experimenter is very likely to leave out of account various considerations and condi-

tions, which may render his experiments worthless. Some accurate knowledge of these subjects is also necessary before any one can be in a position to make a proper use of chemical analyses, even after such analyses have been supplied to him. Even in the selection of samples of soils for analysis, there is reason to fear that, from want of sufficient knowledge, errors are often made, which render the analyses worthless for any practical purpose. It is generally recommended that small portions of soil be taken from several different parts of the field or farm, and then mixed together,—a precaution, no doubt, necessary in many cases, but one requiring the exercise of discrimination. The soil in one part of a field often differs considerably from that in another part; and in such cases a mixture of samples selected in this way from the different parts, gives a soil different from that actually existing in any part of the field; and the analysis can serve no purpose, except that of misleading, as it is not with a mixture of the soils existing in his different fields, or different parts of the same field, that the farmer has to deal, but with each part separately.

Instead of purchasing artificial manures, it is now considered by some to be more profitable to lay out the money upon feeding stuffs, as such articles, after having been made available for the fattening of stock, enhance considerably the value of the farm-yard manure. The question is one which a knowledge of science among practical farmers would be of great assistance in solving. Were a knowledge of chemistry to become general among farmers, it would also tend very much to check the adulteration of manures and feeding stuffs, which at present prevails to so large an extent. There would soon be fewer articles of the kind sold at prices one-third or one-half above their real value, as farmers would not then be so much at the mercy of unscrupulous manufacturers as they are at present. Many a farmer, doubtless, loses every year as much, in this way alone, as would pay for a course of scientific instruction. Another evil, which might have been prevented by a knowledge of science, has been the spoiling of a great deal of land, by the injudicious and excessive use of guano and other stimulating substances, without sufficient attention being paid to the supply of the other necessary ingredients in the soil. Did space permit, mention might be made of many other ways in which practical agriculturists would derive advantage from a knowledge of science, there being many circumstances in which important assistance can be derived from a knowledge of the principles upon which the practice of one's profession is based; and practical farmers would have an opportunity of seeing many applications of science to their business which escape the notice of professional chemists and other scientific men, who have little opportunity for attending to farming operations. As bones

and guano, and other artificial manures, which have enabled farmers to substitute luxuriant fields of turnips for naked fallows, become every year scarcer and dearer, intelligent skill and discrimination will be more and more needed in the use of them; and it will become more necessary to carefully preserve and utilise all waste products of the farm. The more difficult it becomes to make farming pay the more important will become the possession of such knowledge as will enable farmers to turn all their opportunities to the best account.

*Cause of Backward State of Scientific Education in Scotland.*—The chief reason why Scotland has been falling behind most other countries in scientific education, appears to be the exceptionally high character of her elementary schools, and their connection with the universities,—the very same circumstance to which, in time past, she has owed her educational superiority. It has been a distinguishing feature of the Scotch parish schools, that they have afforded secondary as well as elementary education; and this circumstance has been the means of preventing the development of any system of secondary schools like what exists in most other countries. Unfortunately, however, it is only some of the higher subjects that can be taught successfully in elementary schools—such as classics and mathematics—and so, owing to this circumstance, and the fact that these are the subjects required by the few who are to enter the universities, these are generally the only secondary subjects taught; and in this way the schools have come to render the secondary education of the country very one-sided. For the teaching of classics and mathematics, there is nothing necessary beyond a few books and a slate or black-board. It has been customary for the few pupils learning these subjects, to sit in a corner by themselves, and work out the subjects mainly by their own labour, the master looking their way only a few minutes now and then, in the short intervals between classes, to give them a lift over any difficulty when necessary. The branches of science which agriculturists require, however, cannot be properly taught in this way. For the successful teaching of chemistry, it is necessary to have an apartment fitted up as a laboratory, and provided with a good deal of apparatus and material. For the study of such subjects as geology and natural history, again, a good many specimens are necessary. A few lessons, no doubt, might be given from all these subjects to school classes without much material; but any attempt at giving a proper course of instruction in any of them, without the illustrations, must end in failure. One might as well send a youth to a parish school with a book to learn to be a blacksmith, or a carpenter, as to learn chemistry. Even were the requisite apparatus and material provided (and very few school-boards will think of going to the expense of doing this), it

would be quite impossible for any one to do much in the way of teaching these subjects, and attend to an elementary school at the same time. In the very few secondary schools which exist in Scotland, there would be much less difficulty experienced in teaching these branches of science; but in these schools also the object kept chiefly in view is the preparation of youths for the university classes; and this determines the course of instruction. Accordingly, the subjects to which attention is devoted there also are classics and mathematics, but chiefly the former; and although there may be a considerable proportion of the pupils not destined for the university, or even the majority may be such, it is found most convenient to give them the same course of instruction as the rest. In most of the burghs and small towns, where large elementary schools are now being formed, with a staff of several teachers and a suitable organisation and division of labour, a classroom might easily be fitted up with the necessary appliances, and the services of a master secured, who could devote a portion of his time to giving a course of instruction in chemistry and some of those other branches of science which are of the greatest industrial and educational importance; but there is as yet but little or no appearance of school-boards turning this opportunity to advantage. Few members of these school-boards have received any scientific training themselves, and consequently they are not sufficiently alive to the importance of such to the rising generation; and neglecting to look beyond Scotland to see what advances are being made in other countries, they are apt to imitate what was in use when they were at school; and there is thus a likelihood of the defects of the system being perpetuated. In these schools, therefore, the secondary subjects for which provision is made are also classics and mathematics,—the subjects required by pupils who are intended for the universities. This suits well enough the few, one in a hundred or so, who do go to the universities from these schools, since, as long as a knowledge of Greek and Latin is compulsory, the school age seems the best time for acquiring it, and these pupils have an opportunity of attending better science classes afterwards at the universities at a more suitable age. But the system does not suit so well the many, who do not go to the university, and who finish their education at school, and have, in consequence of this arrangement, to commence the business of life with minds well stored, it may be, with the fables of the ancients, but as ignorant of those branches of science which would furnish the key to their respective professions as those who lived in the dark ages. It seems of more importance that science should find a place in the higher classes of schools than in the arts curriculum of the universities, as most of those in the former are destined for pursuits of a practical nature, and conse-



quently a scientific training is likely to be of more use to them than to those who go through the university curriculum, the most of whom are destined for public speakers, and therefore find the study of classics a useful training.

This exclusion of scientific teaching from the schools in Scotland is all the more to be regretted that the Scotch are known to have a decided turn both for acquiring scientific knowledge and for applying it to practical purposes. Judging from the general ignorance of such subjects which still prevails, one might be inclined to doubt the truth of this; but then it is necessary to bear in mind that science is placed altogether at a disadvantage in this country. It is not taught in the schools, and even at the universities the study of it is so much discouraged that it is little wonder it should be slighted to a great extent by the majority of students. In the competition for the numerous bursaries and prizes, which are objects of ambition among students, science as yet practically goes for nothing, mostly all the rewards going to foster artificially the study of classics. In the examination for degrees, again, except in the case of medical degrees, the sciences, even when they have a place in the compulsory curriculum, are treated as of secondary importance; and they have no place in most of the examinations which students have to undergo after they are done with the university. In the examination of schoolmasters by the university examiners, care has been taken to see that the candidates possessed a knowledge of Latin and Greek, but no one has been asked whether he could teach the elements of any of the physical sciences. These circumstances tend to make students look upon the physical sciences as subjects that don't pay, and need not be attended to; and as more subjects of study are generally crowded into the curriculum than most students can well overtake, there is a strong tendency to put off to a more convenient season everything that is not absolutely compulsory. In these circumstances it is not surprising that the physical sciences are slighted even by those who would otherwise show a decided preference for them. Were Greek and Latin put in the same unfavourable position, there would doubtless soon be even less attention bestowed upon these subjects than there now is upon the sciences. Whenever Scotch youths are educated out of Scotland, and are not biassed in their choice of subjects by any such means as those alluded to, they generally show a decided preference, as well as a superior aptitude for scientific studies. The writer's own experience in this matter has been exactly similar to that of others. He was for some time employed as teacher of chemistry and experimental physics at a large educational establishment in London, where the pupils, who varied from twelve to eighteen years of age, and had received their earlier education in their own respective countries, con-

sisted chiefly of English, Scotch, Irish, and Spanish youths, with a sprinkling from other nations on the continent of Europe, Africa, and South America. As the pupils belonged principally to the upper classes of society, and many of them were not destined for anything in particular, they were allowed to a large extent to follow the bent of their own inclination as far as the choice of subjects was concerned; and so the Scotch youths, almost without exception, took to physical science, and in a very marked degree excelled all the rest. Next to them came the English, and then the Irish, and lowest of all stood the Spaniards, the most of whom showed but little taste and still less aptitude for scientific studies. At languages, on the other hand, the order in which the representatives of the different nations came was almost inverted. At Greek and Latin the Scotch youths stood about the bottom of the list. This is only in accordance with what has, in similar circumstances, been found to occur elsewhere; and there can be little room for doubt but that if the study of science received the same encouragement in this country as that of classics, Scotland, instead of being amongst the last, would soon be amongst the foremost of scientific nations; and there is no nation better fitted than the Scotch for turning scientific knowledge to practical account in the industrial employments of life.

*Want of Suitable Means for Agricultural Education.*—Supposing that farmers are fully alive to the importance of giving their sons a sufficient training in chemistry and those other branches of science which have a bearing on agriculture, how are they at present to obtain what they want? The parish schools, where most young farmers are educated, do not afford a training in these subjects, and, as has been already observed, never can do so successfully, as a room fitted up with a good many costly appliances would first be necessary, and it would be impossible to teach these subjects and carry on the work of an elementary school at the same time. The burgh schools, and the very few boarding and other secondary schools in the country, which might be made to afford scientific training, do not afford it; and even were science introduced into these, there is not much reason to expect that the course of instruction would take a shape specially suited to agriculturists. There are no special science schools or colleges yet in Scotland, although such now flourish in England and on the Continent. The only course left for them is to attend the science classes at the universities. This would no doubt be suitable for a few who are prepared to incur the necessary expenditure in time and money, and who have had a sufficient preparatory training to enable them to benefit by the university classes; but it would prove quite unsuitable for the great majority, who would find the course of instruction much too extensive for their purpose, and the style of lecturing ill adapted to their capacity and

previous training. Before they would be in a position to derive much benefit from a course of lectures on agriculture, they would have to be first properly grounded in chemistry, and possess some knowledge of vegetable physiology: and that would necessitate their previously attending the professors of chemistry and botany. Of the other subjects of which they would require a knowledge, some fall within the province of the professor of Natural History, and others are included in the courses of lectures delivered by the professors of Geology and Natural Philosophy. Thus, owing to the extent to which the subdivision of the sciences has been carried, they would, before they could get what scientific instruction they wanted, have to attend about half a dozen different classes, although but a comparatively small proportion of what was gone over in most of these classes would have any special bearing upon agriculture. In order to attend so many classes, a residence of two or three seasons at the university would be necessary; and this, together with the class fees and other expenses, would involve a much greater expenditure of both time and money than most farmers would ever think of incurring. A no less serious obstacle would be that, as each professor has a wide field to go over in the course of the session, and must lecture to suit the majority of his class, who have had a much more extensive previous training, the young agriculturists would find themselves dragged over the field (which would be a great deal wider than was necessary for their purpose) at a rate which would prevent them carrying off the knowledge which they do want. Most of them would leave the classes with notions of the subjects too vague and inaccurate to be of any use for practical purposes.

*Suggestions*—The obstacles which now stand in the way of obtaining a suitable agricultural education would be obviated, were a few schools, or whatever they might be called, established in different parts of the country, to which farmers could send their sons for a season after leaving the parish schools, and where they could receive a course of instruction adapted to their capacity and circumstances, and combining as much of the various branches of science as have a bearing upon agriculture. Three or four such places would probably, at the outset at least, be found sufficient for the whole of Scotland. One situated at Elgin, Keith, or Huntly, or even at Banff, would accommodate the north-eastern counties from the Grampians to Inverness, or for that matter to the north of Scotland. Another situated about Perth would suffice for the district lying between the Grampians and the Forth, and a similar provision might be made for the south of Scotland. It would not, of course be necessary to set them all agoing at once; the experiment might be first tried in the districts north of the Forth, where something of the kind seems most wanted. If a few acres of land were added to each, experi-

mental stations might be formed in a very economical way, as those in charge of the schools could also superintend the carrying out of the experiments. If the instruction were all comprehended in one season's course, as it might be, and as would seem desirable, the pupils would be all in one class; and consequently there would not be much required either in the way of buildings or teaching staff; and after the first outlay for apparatus and specimens there would not be much wanted for material. Considering the way in which institutions of the kind are calculated to affect the interests of landed proprietors, there should not be much difficulty experienced with regard to their maintenance. There would not be much more required for one school than will be required in many a rural parish for education under the new Education Act; and that would be a mere trifle for half a dozen counties to raise. In course of time the schools would probably receive some endowment, and might become self-supporting, but they could not be so at the outset. The fees, however, would amount to something; and something would also probably be got from Government. The Highland and Agricultural Society could find few better means of advancing agriculture than aiding the undertaking with their influence and an annual contribution from their funds, and it would be but a small matter for the Commissioners of Supply for the counties to provide the rest.

As to the course of instruction, again, the subject to which chief prominence should be given would be chemistry. The first and greater part of the season should be devoted to grounding the pupils well in the elements of chemistry and vegetable physiology; and then should follow the special application of these to agriculture. Lecturing on the theory of agriculture to those who are not already versed in chemistry, is all but useless, if, indeed, it is not in many cases worse. Having to listen to disquisitions about terms which they do not understand, and names of substances which they have never seen, and about whose very existence they are sceptical, they find themselves all the while in a *terra incognita*; and necessarily failing to see in most cases how they are to derive any advantage from what they hear, they are apt to go away prejudiced against science. On the other hand, if once properly grounded in chemistry, there is nothing to prevent any one from learning the application of it to agriculture at his own fireside by the aid of such works as those of Liebig or Johnston, or, what would serve his purpose better, the more recent works of Professors Anderson and Wilson. Chemistry is one of the most unfavourable of subjects for being acquired from books by one's self; but were once a proper knowledge of that science diffused through the agricultural population by the aid of such institutions as the writer has suggested, such men as Professors Anderson and Wilson might do a vast deal more to

advance agriculture by publishing the result of their labours than they can now, as the public would then be in a position to benefit by their publications.

Some of the other subjects which should find a place in the course of instruction, would be the elements of geology, more particularly the composition of the different rock formations, and their influence upon the soils of the country; the elements of animal physiology; light, and its influence upon vegetation; heat; steam, with its properties, and the principles of the steam-engine; the construction and use of meteorological instruments; land-surveying, levelling, and plan drawing; and farm book-keeping. Little can be done at geology in common schools for want of proper specimens and diagrams. Land-surveying is often taught, but there is generally little done in the way of putting the theory into practice, or constructing plans; and beyond a measuring chain and cross staff, the pupils never get even a sight of any surveying or levelling instruments, not to speak of their learning to use them. As to meteorological instruments, even the construction and use of the barometer is but imperfectly understood amongst agriculturists; and so important an instrument for indicating the approach of rain, as the hygrometer, is almost unknown. Book-keeping is taught in most of the parish schools, but the system almost invariably in use is what would suit any wholesale merchant in town; and so agricultural pupils seldom get a chance of seeing any system specially suited to their own purpose. Many farmers are, doubtless, often losers by not being more expert book-keepers. They know what their balance with their banker is, and whether it be increasing or diminishing, but from the want of keeping a properly detailed system of accounts, and from neglecting to make allowance for many things which affect their profits, they cannot tell accurately what transactions are paying and what are not, or what should be extended and what discontinued. At such institutions as the writer has suggested, the teaching of all these subjects could be specially adapted to the end in view. There would be many ways in which farmers would in after life derive advantage from such a course of instruction, and it should not be forgotten that whatever advances the interests of farmers advances at the same time the interests of proprietors.

ON THE BEST MODE OF CULTIVATING GRASS IN SCOTLAND  
UNDER ROTATION.

By GEORGE BRUCE, Wealthiton, Keig, Aberdeenshire.

[*Premium—Ten Sovereigns.*]

THE reporter is specially to direct his attention to the system often adopted in the management of farms hitherto worked upon the five-years' rotation, arising from the longer period under which land is now left in grass.

The best modes of preparing land for sowing out, as well as its management during three or four years' in grass to be considered, also the extent to which, on the average of Scotch farms, the diminished average under turnip may be compensated by a heavier yield of crop per acre over the whole rotation.

When we consider the great breadth of grass under rotation in Scotland, that it covers fully 1,000,000 acres of land, and that our rents and wages are getting larger, the importance of knowing how the greatest possible crops can be raised will be evident. Until, however, the farmer gets a practical knowledge of his profession, and be able to judge when his work is rightly carried out, better crops will not be raised, larger rents will not be paid, and our country will still have to import more and more of our food supplies; and as wages continue to rise, unless steam power be more easily attained than hitherto, a greater breadth of grass is certain to be sown. If it be true that Scotland is not half farmed, that it is possible to grow double the crops with a little more care and cost than what the most of farmers bestow, the field for enterprise must be wide indeed. Deep cultivation, so as to allow the roots of plants to grow, coupled with a right and proper selection of seeds to suit the different soils, always proves beneficial, and with no seeds is that more true than with the grasses.

It is now an undisputed fact that a good crop of grass is always followed by a good crop of grain, and further, that the character of the grass crop has a direct bearing on all the succeeding crops. By experiment, when we dug up and washed out the roots of different parts of second years' grass, we found that in their undried state they weighed from 20 to 30 cwts. per imperial acre. The amount of decayed vegetable matter in the roots of a good crop of clover when decomposed, must, therefore, enrich land very much, and the farmer cannot bestow too much attention on this part of his labours. To study the roots of the different crops, the depth of soil necessary for their healthy growth, and the food for the next crop, which, when decomposed, they leave in the soil, is not only most interesting, but it is the very groundwork of successful farming.

In Aberdeenshire many shrewd farmers, who used to realise a considerable sum for the foggage on the farm in autumn to be depastured by sheep, never allow such a thing now, because the succeeding crops are so much better, that they pay all the possible profit derived from pasturing it.

It may seem strange, but it is nevertheless true, that since the introduction of clover seeds into this country about the beginning of the seventeenth century, in a great many districts little improvement on the way of laying down grass has been effected. The importance of selecting the right kind of seeds for the soil, the crop and the climate can scarcely be overestimated, and the loss occasioned to agriculture by giving the wrong kind and quantity of seeds is very great indeed. The farmer may sometimes manage to change the nature and composition of his soil to suit the crop, but the better way is to suit the crop to the soil.

*Preparation of Land for Seeds.*—One of the first things the farmer has to do before laying down grass seeds, is to clean his land of all noxious weeds. No soil will retain a good crop of grass if half filled with a crop of weeds. Not only do the weeds grow up and stop the growth of the plant you wish, but they also carry away a great deal of its food. The loss to the turnip crop by allowing weeds to grow is very great, but nothing compared to the loss which they occasion during the following rotations. Besides choking the clover and ryegrass plants which feed our cattle, they occupy a place in our fields which should be filled with herbage of the right sort.

The cleaning of land is a very important matter, and is often most imperfectly done; and among the many errors the farmer falls into, none is more common. To work the land in bad order does, however, still more harm, and to the painstaking young farmer who has the ambition to be the first in his district to have his seeds in the ground, nothing is more injurious. Far too often do we see land ploughed and seeds sown when the water is lying in pools on the surface. The bad effect of this is easily seen on the subsequent turnip crop, in often breeding "finger and toe," although in grass it is not so much noticed.

~ Owing to the smallness of clover seeds, there being from 240,000 to 250,000 in a pound, the farmer too often, through the want of due attention in the preparation of the soil, makes the mistake of burying a large proportion of his seeds. By experiments we find that clover seeds braird best with half an inch of covering, while, if it is covered with soil to a depth of  $1\frac{1}{2}$  inch none of the seed germinates. Too much labour cannot, also, be expended in preparing the soil by subsoiling and draining, the rootlets of the clover plant being very feeble. Before sowing grasses we always roll the ground, and in some cases where

there is a clay loam, it might be rolled several times, so as to get a fine mould. It is quite evident that if the small clover seeds be sown on a rough cloddy surface one-half the number laid down will not germinate.

One great element of success in raising good grass is to sow good seeds. We do not think clover seeds are so much adulterated as they were some years ago, but still doctored samples are yet to be met with. We were lately shown white clover seed, costing a good deal less money than we were paying, which we found, after examination, to be doctored. It had quite an unnatural colour, and had been so skilfully treated that it was only after immersing it in water that the colouring came off. It is when seeds are high priced that they pay doctoring, but the improved appearance in alsyke clover has been known to give an advance in price of 50 per cent. Last season a very large parcel of old trefoil clover was sold at L.14 per ton; and as a large proportion of old seeds do not grow, they are mixed with new seeds, and are like the kiln-dried rape with which turnip seeds are adulterated—"Dead men tell no tales."

*Selection of Seeds.*—In selecting seed the farmer should choose a pure clean sample, avoiding any small or weak seeds, and should make it a point to select a good even sample. A very common way of examining clover seeds is to damp the finger and place it on the sample. This is not a very good plan; because the best seeds, being largest, adhere to the finger, while the sand and poor seeds will be left. The better way is for one to put his hand into the bag and take out a good large sample, and compare it on paper with the other samples. After some experience in laying down grasses in different districts, we find that soil and climate must both be considered, and also the kind of grasses we should sow, else we shall not get good grass. The finest English red clover suits the deep soils of Morayshire, but it is not the most profitable for the high-lying districts of Aberdeen and Banff shires. Pure English-grown cowgrass cannot also suit all soils, nor should the farmer order his seedsman to send him ryegrass and clover seeds always of the most expensive kinds; for we find that at certain altitudes a mixture of foreign-grown red clover, which costs 30s. per cwt. less than the English-grown seed, will suit equally as well, if not better. We proved this in 1872. On a field of light soil, 620 feet above the sea-level, we set aside three plots for grass, and gave each plot different countries' growth of red clover. In No. 1 plot, along with alsyke, white, and trefoil clover, we put English-grown red and cowgrass clover. In No. 2 plot, besides the white, alsyke, and trefoil clover, we put pure German-grown red clover. In No. 3 plot we put equal quantities of foreign and English grown red clover, and also the same quantities of trefoil, white, and



alsyke clover as we gave the other two plots. We gave each plot 38 lbs. of ryegrass seeds per imperial acre. The crop was depastured, and we did not get it weighed; but plot No. 3 was the best grass, except in a loamy part of No. 1. As the roots and stems of clover grow a good deal in direct proportion to each other, we dug up and washed out the clover roots from a part of each plot. No. 1 plot weighed 27 cwts., No. 2 plot 24 cwts., and No. 3 plot 29 cwts. per imperial acre. On the loamy part of No. 1 plot the roots weighed 31 cwts. per acre, no doubt from being sown with English-grown clovers; and had all the plots been hay instead of pasture, the crop on the loamy part of No. 1 plot would have weighed more than either of the other two plots, the leaf of the English-grown red and cowgrass clover being much larger than that of foreign-grown.

*Quantity of Seeds.*—Without respect to the soil or the crop, one farmer sows 50 lbs. of ryegrass and 4 lbs. of clover seeds per acre, while his nearest neighbour sows 30 lbs. of ryegrass and 12 lbs. of clover seeds. One of the two must be wrong. Unless soil, crop, and climate are all taken into account when choosing seeds, we shall never grow good crops. Besides, influence of temperature, the distance from the sea, and altitude, have also to be considered.

As good soils will grow as many as ten times more plants on the same extent as a poor soil, a larger quantity and more varieties of seeds should be sown in good land. It is very often the case that the farmer gives a large quantity of cheap ryegrass seed to his soil, just because it is not very good. He therefore sows as much as two bushels per imperial acre, whatever the quality may be, and no doubt having a large percentage of weeds. Even in good soil certain farmers always give a large quantity, but never give more for it than 2s. 6d. or 3s. per bushel. Surely the farmer who gives from 36 to 40 lbs. per imperial acre of good ryegrass, which costs him little or nothing more than his neighbour's two bushels of inferior seeds, is sowing more to his profit. The farmer also who sows his ryegrass seeds exclusively by measure, instead of both weighing and measuring them, when they vary from 12 to 36 lbs. per bushel, must also be wrong, as it is entirely by chance if he give the soil the right quantity.

If a mistake is made in giving the soil too little clover seeds, it is also quite possible to waste money in putting in too much. Some farmers sow from 14 to 16 lbs. per imperial acre, which is more than a seed to every square inch of soil—we believe too many to leave room for the ryegrass seeds. The following tables give the quantities of grass seeds suitable for different soils:—

TABLE 1.

*Seeds for the Five-Course Rotation of Alternate Husbandry.*

Names of Grasses.	First Year— Hay or Pasture		Second Year— Pasture	
	Light Soil.	Clay Soil	Loam Soil	High or Barren Soil
Perennial Ryegrass, . .	38	34	34	38
Italian do. . . .	...	6	6	..
English Red Clover, . .	2	2½	2½	1
Cowgrass do. . . .	1	1	1	...
Foreign Red do. . . .	2	1	1	3
White do. . . .	1½	1½	1½	1
Alyke do. . . .	1	1	1	2
Trefoil do. . . .	1½	1	1	2
Natural Grasses, . . .	1	2	2	1
Pounds,	48	50	50	48

TABLE 2.

*Seeds for the Six-Course Rotation of Alternate Husbandry.*

Names of Grasses.	First Year— Hay or Pasture.		Second and Third— Pasture.	
	Light Soil	Clay Soil	Loam Soil	High or Barren Soil
Perennial Ryegrass, . .	38	34	34	38
Italian do. . . .	...	6	6	..
English Red Clover, . .	2	2	2	1
Cowgrass do. . . .	1½	2½	2½	1
Foreign Red do. . . .	2	1	1	2
White do. . . .	1½	1½	1½	1
Alyke do. . . .	1	1	1	1
Trefoil do. . . .	1	1	1	2
Natural Grasses, . . .	2	2	3	2
Pounds,	49	51	52	48

*Clovers.*—Clovers belong in botany to the order Leguminosæ, and so far as is known, and so far as culture has effected improvement, the grasses sown in Scotland are the only kinds found adapted and profitable. There are others, such as the crimson clover (*Trifolium incarnatum*) and Lucerne, of great succulency; but are of tender habit, and are not used.

*Red Clover* (*Trifolium pratense*).—English red clover is the strongest, largest, and most productive red grown. Growers for the sake of extra profit are apt to mix their clovers with foreign seeds, and on this account pure English seed is difficult to get. The size of the seed is, however, a sure criterion of its purity.

Good red come from the north of France and Germany. The seeds are smaller than the English, and the leaf is also a good deal less.

The Dutch-grown seed is paler in colour, but is a good useful seed.

Welsh reds are hardy, and are coming greatly into favour; but, like the English seed, are difficult to get pure. Old Dutch seed is often milled and doctored, and made to have a shining appearance, to resemble the Welsh seed. We believe this is effected by shaking the seed in a bag with shot lead or indigo.

The quantity of American red clover now imported is very great. It is even smaller in size than the German or French seeds, and is often weak. Unless in favourable seasons, it has not strength for our changeable climate. Frost one day, and rain and snow the next, are apt to throw out the clover unless good strong seeds are sown. On a field of clay loam, on sowing our grasses this spring, we gave one ridge American-grown red clover, along with the usual quantity of white, alsyke, and trefoil clover. The rest of the field was sown with alsyke, white, trefoil, and part English and German red clover. The grain crop was cut two months ago, and the inferiority of the grass sown with the American red is so great as to be easily distinguished.

*Cowgrass Clover* or *Perennial Red* (*Trifolium pratense perenne*).—In appearance this clover is very similar to the English broad-leaved red. It is, however, far more permanent, and as it lives longer than the common red, the roots are always spreading and getting deeper, and the leaves and stalks also grow larger. The roots go several feet below the surface, and deep cultivation is therefore necessary, as the tap-root goes right away down to the subsoil, and if the rootlets there meet any barrier, the plant gets stunted and stops growing.

*White Clover* (*Trifolium repens*).—Our principal supplies of white clover come from Silesia and Bohemia. A good deal is also ripened in England. The English-grown is stronger than the foreign, and gives better crops. Few plants vary so much in size. In dry, poor, sandy soils, it grows so flat, that it is scarcely perceptible, hence on manuring by top-dressing a fine crop appears where it has never before been observed. The prettiest pale yellow sample is not the most profitable to the farmer, as in many cases the seeds are not fully ripe. The best produce is from a good even sample free from all worm-eaten seeds, and possessing a good natural colour. Seeds which are dark in colour should be particularly guarded against; old white clover is doctored by damping it, and then drying the seeds with fumes of sulphur, but it is only when prices are high that this is done.

At present there is a growing favour for white clover, and for pasture it is one of our finest grasses. It can, however, be valued too highly. White clover finds its nourishment on the surface soils, and does not go far to seek its food. This must eventually tell on the farmer, who sows it largely, because if he does not grow clovers with large tap-roots he will find his grain and straw crops decrease slowly but surely. In Aberdeenshire some of the best farms are entirely running to waste owing to the "penny wise and pound foolish" farmers sowing only a small quantity of clover seeds, the greater proportion being white clover. When few clovers are sown, the natural white comes in pretty plentifully, but it leaves little food in the soil for the following crops.

*Alsyke Clover* (*Trifolium hybridum*).—This perennial clover gets its name from the district of Alsyke, in Sweden, and is one of the most valuable grasses the farmer can sow. Its green colour distinguishes it from the other clovers. At the introduction of alsyke many farmers gave their fields too much of it; and as it continues to grow from May to August, they imagined the cattle did not eat it. No doubt cattle do not care for too much of it, it being a rather strong-tasted plant, but we seldom see much of it uneaten by September. It is well adapted for hay; and on a heavy loam, or on a cold barren soil, which does not grow other clovers, alsyke grows well. Mr M'Combie, M.P., who takes a great interest in agricultural matters, tells us that on an outlying field at Tillyfour, 700 feet above the sea-level, were it not for alsyke clover, he would not have grass there at all.

*Yellow or Trefoil Clover* (*Medicago lupulina*).—Our supplies of trefoil come from the north of France and England, the latter country's growth being the best. Like alsyke, cattle do not care for too much of it; but it costs so little that farmers should sow it, though only as a manurial. In very dry soils it is almost indispensable, and for sheep pasture it is one of the most suitable.

*Ryegrass* belongs in botany to the Graminaceæ order. This order also comprehends wheat, barley, rice, and oats, and is the most important order in the vegetable world.

*Perennial Ryegrass* (*Lolium perenne*).—Is a fibrous-rooted grass of from two to four years' duration. There are several varieties of this grass, differing very much in essential points, all which should be noticed. Pacey's variety is one of the finest perennial grasses sown, but it is more suited for pasture than for a mixed crop; and in altitudes 700 or 800 feet above the sea-level, even for pasture it is not so suitable as seed grown in Ayrshire. In districts from 200 to 300 feet above the sea-level it is, however, found to be a most useful grass, especially in

autumn. The Ayrshire variety of ryegrass is not so difficult to please with a soil, and always gives a good return if sown for hay, but for pasture it does not suit so well as Pacey's.

*Annual Ryegrass*, on comparison with perennial seed, will be found to be more open-bellied. It is more productive than the first crop of perennial, and it produces more stalks and seeds, but fewer root leaves. Failures from the effects of frosts, attacks of insects, and fungoid disease, are, we believe, the cause of perennial seed becoming annual. In selecting ryegrass seeds, weak and impure or badly coloured samples should be guarded against; and if possible seeds grown from second or third years' grass, free from weeds and possessing a good colour, should always be sown. Before sowing the ryegrass seeds, it is advisable to prove their germinating power, and a very simple way is to put a known number of seeds on a fine light soil and cover them with a piece of turf. The good seeds will germinate in a few days. One of the best modes of examining ryegrass seeds is to strew a little on your coat sleeve, when any impurities will be easily detected.

*Italian Ryegrass* (*Lolium italicum*).—This ryegrass is a native of the south of France and north of Italy, and was first introduced into this country about 1830. It is now ripened in England to a very large extent; but the foreign seed is believed to be the best, as it is perennial. The leading characteristic of Italian ryegrass is an awn on the lower palea. In purchasing it the awn is undoubtedly a proof of its purity; but its absence is no proof that it is not genuine, as the awn is often broken off in packing. We proved this by sowing two plots, one with seeds having awns, and the other plot with beardless seeds. There was no difference of crop in the plots. No seed is, however, more apt to be adulterated, especially with broom grass and soft meadow grass.

Italian ryegrass does not suit light soils. It likes a good heavy loam, and many good soils which do not grow clover should get an extra quantity of this seed, when not only will the pasture be greatly improved, but the Italian will add fertility to the land. As it comes a month earlier than any other grass, it is especially valuable in a backward spring, or when the supply of turnips are deficient, and the stock will do much more good on it than dry straw, even though supplemented with cake.

*Cocksfoot* (*Dactylis glomerata*), suitable for good soils of good depth, and is very profitable when sown with other grasses.

*Hard Fescue* (*Festuca duriuscula*) is recommended for a variety of soils, and comes early.

*Meadow Fescue* (*Festuca pratensis*) prefers good damp soils.

*Rough-stalked Meadow* (*Poa trivialis*) prefers a good sheltered

damp soil, and is a most valuable grass as a mixture in pasture.

*Timothy* or *Cat's Tail* (*Phleum pratense*) prefers deep mossy soil, or damp tenacious soil. Is the only grass that forms a substitute for ryegrass beyond the limits in altitude of its successful growth. Timothy is very nutritious.

"*Clover Sick Soil*."—After many years' experiments with different manures, in the attempt to cure what is called "clover sick soil," we find that it is only in exceptional cases that any special manure will be effective.

A field of sandy loam, which for twenty years gave us good grass, began to show signs of being "clover sick." We therefore harrowed in with the grass seeds 10 bushels of bone dust per imperial acre. This had the desired effect, not only on the grass, but all throughout the rotation, the extra return of grain and straw, to say nothing of the beautiful sward of grass we thus obtained, having more than repaid the expense of manure.

In some districts of Scotland the clover plant dies out after taking root. This is not often the case in the northern counties, as the seeds in "clover sick" soil, with few exceptions, never germinate at all. Having applied bone dust to several fields of fine loam, where clover did not grow, we failed to get plants, except near the gate and head and end ridges, which was much trodden upon. We began to imagine that, like many former experiments, we had been going on the wrong tack. We therefore got a heavy roller, and, before putting in our grass seeds, we rolled the field twice. The soil was a good loam, and for years before showed signs of sickness. The experiment realised our utmost expectations, the increase of clover over the former crop being very great.

On the farm of Dunnydeer (Insch), one of the largest in Aberdeenshire, Mr Beattie had several fields which refused to grow clover. He therefore, last season, got a heavy roller, weighing 15 cwt., made by Messrs Ben. Reid & Co., Aberdeen (the makers of the famed corn-drill), and, before sowing his grass seeds, he rolled his fields. The ends of the roller are fitted with grease-boxes for lubricating the spindle; the wheels are three inches wide, and each works separately and loosely on the spindle; the edges or rim are wedge-shaped, and easily break and reduce the hardest clods, while at the same time, from the particular form of the wheels when together, they press the ground much more firmly than the smooth or plain roller, making a firm bed for the seeds. A ridge on one field was missed with the roller to prove its efficacy; and while there is abundance of clover plants where the soil was rolled, on the ridge that was unrolled scarcely a plant is to be seen.

Before we found the heavy roller so useful on good loams,

when rolling the first year's grass in spring we put in 5 lbs. of pure English red clover to each imperial acre. Although the clover did not grow when sown the previous year, it now germinated at once, and we therefore only lost the first or one year's crop.

*The Five-Course Rotation.*—Very few farmers in the counties of Aberdeen or Banff crop on the five-course rotation, the six-course being now almost generally adopted. In a very few cases, where the management of land is in the hands of those who know little of farming, the tenant is bound to crop on the five-years' course; but landowners are now seeing the great benefit their property derives by cropping on the six-course rotation, and are therefore willing to alter any old regulations when requested to do so.

We do not think landlords are studying their interests when they bind their tenants to farm on any specific course; as a system suitable for one kind of soil and climate may be very unsuitable for another, or it may even be beneficial to change the system on the same farm after a time. How, then, is it at all probable that the greatest possible crops will be raised when different kinds of soils get all the same treatment? Why should not the farmer be allowed to crop any field, or part of a field, as he thinks right, if the landlord gets security that he will be paid for any miscropping should the tenant leave in the middle of his lease, the tenant always being bound to leave the farm in proper rotation? Unless a great many useless restrictions, now in force on many estates, be swept away, many farms will never return the crops they otherwise would do.

There are, however, a good many advantages to be derived from the five-course system. The principal advantage is that the farmer has a greater breadth of turnips; and as the Scotch farmer has now to depend so much on feeding stock, how the greatest quantity of winter food can be raised is one of his most important questions.

On a five-years' course of cropping, for a few years the farmer may grow more turnips, having one-sixth more acres in crop, accruing from the five-course system; but after a time it will be found that the crop of turnips gets lighter, and the succeeding crops also become poorer and poorer. On the other hand, when we cropped on the six-course, for two rotations we had not so many turnips (more of the farm being in grass), but the following crops were always better than on the five-course, and all the gain made on the extra few acres of turnips, on the shorter rotation, never made up our loss on the succeeding crops. Were we to add the extra manure and labour we required on the five-course, both which now cost so much, not only would the profit from having a greater breadth of turnips on the five-course

system been counterbalanced, but we certainly would be the losers, so that unless in exceptional cases, such as on a well-drained clay loam of good depth, we have always found the six and seven course of cropping the most profitable. It is said that if the farm gets plenty of manure, that equally good crops will be raised per acre on the five as on the six course; and in some districts this may be the case, but in the northern counties it is the exception.

The farm we now rent is partly a clay loam and partly a light soil,—very like a great many farms in the north of Scotland. It was let thirty-eight years ago at 5s. per Scotch acre, and one field was then valued at 1s. 8d. per acre. We drained and subsoiled the whole farm, and the present rent is 25s. per imperial acre. We are now at the end of a nineteen years' lease on the five-course rotation. For the last half of the lease we have manured our turnips at the rate of L.7 sterling per imperial acre, and have consumed annually linseed cake at the rate of L.4 sterling per acre of turnips. It is only on one small field of a clay loam that our turnips are equal to what they were on the six-course system; and we find that, however heavily manured, certain soils will not stand a certain course of cropping; and, after nineteen years farming on the five-course rotation, we are now quite ready and anxious to revert to the six-course. A field of barren cold soil, when on the six-course system, gave us poor grass the third year, in value not equal to the rent we were paying for the land. It was a serious loss to us on the six-course, but now, when we have cropped it on the five-course rotation, it has paid better. On a part of a field of damp clay loam, having a "pan" or subsoil of stiff wet clay, we noticed when this part was left in grass the third year, if the winter was severe, that the grass was nearly all lost by the frost taking effect on the damp subsoil, and throwing out the clover plants. We find it more profitable to crop this kind of soil on the five-course system.

*The Six-Course Rotation.*—The principal advantage of a six-course rotation is that the soil is enriched by the extra amount of decayed vegetable matter which is formed in the soil by the grasses getting a year longer to live on it than on the five-course system.

Secondly, A saving of a fifth of the expense of labour.

Thirdly, A saving of more than a fifth for manure.

Fourthly, A saving of a fifth more grass land for pasture, the only drawback being that the quantity of grain and turnips (only for a time) will be diminished.

It is very seldom "finger and toe" is to be met with on a six-course rotation. On this course the crop of straw is generally 10 per cent. greater than on the five-years' system, and often the grain is 20 per cent. larger; and if a crop or two be got at the



commencement of a five-years' rotation equal to the crop on a sixth course, the loss from even "finger and toe" would not be paid by these extra crops.

In several districts of Caithness, Sutherland, and Ross the most profitable course is the five, or even the four years' system; but this is only in exceptional cases. While the acreage under turnips in Aberdeen and Banffshires in 1874 is much less than in 1873, in Caithness it is a little more.

The following table will show that a great many in Aberdeen and Banffshires are now turning to the six and even seven course of cropping, proving the value of the longer course,—there being in the former nearly 8000 acres and in the latter 1000 more acres sown in grass in 1874 than in 1873.

*Acreage under Turnips or Swedes and Sown Grasses.*

		Turnips or Swedes.	Sown Grasses.
Aberdeenshire, . . .	{ 1873	96,314	236,643
	{ 1874	95,478	244,417
Banffshire, . . . .	{ 1873	26,060	61,836
	{ 1874	25,755	62,958

*Concluding Remarks.*—It is often a difficult matter with the farmer to know how he can use his grass most profitably. By depasturing grass we form more roots than if it is cut for hay; and when we crop on the six and eight course system, and sow a large percentage of perennial seeds, there will be a good deal more organic food left in the soil. Not only should the farmer suit his crop to the soil, but he should also suit his stock to the crop. Although grass may look well on cold high-lying soils, cattle will thrive better on the same quantity of grass on good soils and well sheltered. When renting pasture away from the farm for our feeding stock, they always thrive best on first year's grass. This is in a great measure owing to their being better attended to through the previous winter than they were some years ago, and must therefore get equally as good and nourishing food in summer. Thirty years ago, the Aberdeenshire farmer made more of his grass crops than anything else. The cattle he wintered or bought for his pasture never got any artificial food, barely getting a sufficient supply of necessary food for the system; and therefore, when put on the grass, they grew like mushrooms. When the farmer has not good soil, he will not feed cattle so well as the farmer who is fortunate in having good land, and the former should therefore breed a larger proportion of stock, and sell them early.

To depasture first year's grass up to the beginning of June, allow it to grow until the plants are nearly in full flower, then

cut it and feed fattening stock under cover, is, we believe, the most economical way of consuming grass. We have always found it to be easier on our soil to "cut the grass twice than to seed once;" and as all the beaves in the northern counties intended for Bingley Hall or Smithfield shows are now housed in summer, we have little doubt but that the feeding of commercial animals will ere long be carried out in the same manner.

A careful performance of the ordinary operations of the farm we hold to be far more important than is generally imagined. The technical education of the farmer is as important towards the development of the resources of the land as that of the miner or engineer, and it is a matter for regret that farmers have not greater facilities for its acquisition; but just as in the case of the artificer, no amount of mere head knowledge could ever compensate for the want of mechanical skill, so with the agriculturalist, no scientific knowledge, however expensive or however perfect, will at all make up for the want of practical skill.

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#### ON THE USE OF ARTIFICIAL OR FOREIGN FEEDING SUBSTANCES.

By HUGH BORTHWICK, Old Caberston, Innerleithen.

[*Premium—Three Sovereigns.*]

THE great extent to which artificial feeding substances are now used as animal food, renders this subject a matter of great importance. Some stock-farmers give both cattle and sheep a daily allowance, summer and winter, when feeding for the fat market; and whatever effect this system may have upon the health of the animals, its effects are marked and visible upon the soil where the food is consumed, from its high state of fertility. As the influence of artificial food on the health of animals varies according to the amount and length of time given, and also according to the purpose animals are kept for, we propose to divide stock into two classes, namely, feeding-stock for the fat market, and *hadding* stock, or stock to remain for a time on the farm. We may state at the outset, that we have never known artificial or foreign feeding substances have any influence in producing disease in the animals consuming them, if the feeding substances were sound and free of adulteration. We have fed for the last twenty years from one to five hundred sheep annually, commencing some seasons in the month of September on the grass, and finishing off in the month of March upon turnips. Artificial food was always given to a more or less extent; and during all that period we only once saw any evil resulting from it in stock for the fat

market, and the disease was clearly traced to inferior linseed cake. The case occurred upon the farm of Caberston, amongst a lot of 340 Cheviot wethers. They were folded upon turnips about the middle of October, and a mixture of linseed cake and corn given in equal proportions. One quarter of a pound was allowed each sheep daily for the space of a week, and gradually increased in a few weeks to three-quarters of a pound. In the month of January, nearly three months after the feeding had commenced, two tons of inferior linseed cake were sent as a trial, and mixed with corn in equal proportions. As I was a little suspicious of the quality of the cake, I reduced the feeding to about one-half pound per sheep; and on the third morning after the trial two of the sheep were badly affected. I slaughtered them at once, and the post-mortem examination revealed the disease to be inflammation of the small intestines. On the fifth morning another was affected with the same symptoms, and when slaughtered presented the same appearance. A double quantity of corn was then mixed with the cake, nevertheless other two sheep fell victims to the same disease before the cake was finished. I was anxious to get the cake analysed, to ascertain its nature and the cause of the disease, but my employer declined, on the ground that it was purchased from a respectable dealer, and sent as a trial. Whilst feeding the sheep, however, one fact struck me, which might have had a tendency to aggravate or bring on the disease. Although the feeding was reduced, the sheep did not eat it as well as the cake of good quality, and there was always some left in the boxes for a considerable time; consequently, the more voracious of the sheep might eat a double quantity. This fact is clearly exemplified at the commencement of feeding sheep with artificial food, when there is often considerable loss; but the evil generally lies with the feeder, and not with the food, especially if there are large numbers of sheep in one lot. For example, if there are three or five hundred sheep in one lot where a commencement of artificial food is to be given, half-a-pound per sheep is generally about the quantity given to start with; but the danger lies here, perhaps not above the half of the sheep will taste it for a good many days, and there are always some that will devour it as greedily as if they had been accustomed to it for months, consequently they are liable to gorge themselves to such an extent that death is often the result, or surfeit and founder to such an extent that they will not taste it again for weeks. If sheep are severely foundered with artificial food when folded upon turnips, it is scarcely possible to put on the desired condition for the fat market that season. There is no artificial food that sheep are so liable to be foundered with as corn or barley, especially the latter if given in an unbroken state, but if a mixture of cake is given it reduces the danger to a great

extent. Corn ought never to be given alone to a large extent, it is of far too dry and hot a nature. I have seen this proved with two lots of Cheviot shearling wethers, numbering about 120 each. They were put upon turnips in the month of October, one lot receiving about a quarter of a pound of corn the first week, which was gradually increased to three-quarters of a pound; the other lot got as much as they could consume, which was on an average about one pound and a-half per day per sheep. I saw both of the lots slaughtered for the London market. The first lot was killed in the end of February, and was first-class quality; the other lot, that consumed the double quantity of corn, was slaughtered in the middle of March, and was far deficient in quality, and although there were no symptoms of disease internally, still, upon the outside of the skin, a great many of them, when examined minutely, were broken out in small red pimples, and tucked up in the belly—the other lot being, in butcher's phrase, bellied to the ground, and the mutton of a richer hue. Both of the lots were bred upon the same farm; they were not, however, fed upon the same farm, but the turnips and soil were of a similar nature. A variety of artificial food is of great advantage both for the health and the feeding of stock. We have seen almost all kinds of cake tried for feeding stock for the butcher, but linseed cake, although dearest, is in our opinion by far the best and cheapest in the end. At the same time, although the feeding quality of linseed cake is beyond a doubt, we have seen it fail to put on the desired condition, when given alone with turnips. The case occurred with three cattle that had suffered from disease during the summer. They were tied up in a byre in the month of October, and given full turnips with four pounds of linseed cake each. For the space of three months they made fair progress, but then they came to a stand, at least the improvement was very slow, which was attributed to having been so much deteriorated by disease during the summer. A mixture, however, of bruised corn and barley, along with the cake in equal proportions, was tried, which had the desired effect. Improvement was visible in a short time, and continued till they were finished in fair condition. The cake was of the best quality, but it was clear that either the constitution of the animals or the disease had left some seeds of disorder that did not agree with cake and turnips alone. We have often noticed in the feeding and management of stock when they are ailing, or exhibit a falling off, that a change of food has the desired effect, and in such cases artificial food is very valuable, as in many instances no other change can be obtained. When large lots of sheep are folded upon turnips, and artificial food given, great care ought to be taken at the commencement that some of them do not eat too much. There ought always to be plenty of 'boxes, so that they

do not require to crush forward, as the most timid and mild of the flock always stand at a distance, and it is often several days, or perhaps weeks, before the whole lot has thoroughly learned to eat; consequently, there are always some that are eating a double allowance, and are liable to gorge themselves to such an extent that death is often the result. In many instances the quality of the food is blamed, and at times this over-eating is mistaken for other diseases, even by the most practical and scientific veterinary surgeons. That such is the case the following fact will show. We forbear to mention names, as we have no permission to do so, and would in all probability incur the displeasure of those immediately concerned. The case occurred at the time rinderpest broke out in the southern districts of Scotland. A lot of cattle, numbering about fifteen, were tied up in a byre for feeding for the fat market; they were given full turnips and an allowance of artificial food. In the course of a few days the cattleman in attendance noticed one morning nearly the half of them ailing, and refusing to take any food. The case was immediately reported to the inspector of the district, as required by law. On the arrival of the inspector, he at once pronounced the disease rinderpest, and ordered the whole lot to be slaughtered at once. This was a serious matter for the owner, and he asked the advice of an experienced farmer in the district. He gave as his opinion that the disease was only a surfeit of food, and begged that the cattle might be spared for twenty-four hours to see what type the disease assumed. This suggestion was acted upon, and within that time the cattle showed symptoms of improvement, and in a few days were quite well, and continued so till they were fed off for the fat market. As we have already observed, the only evil effects we have seen resulting from artificial food, where it was sound and free of adulteration, was from overfeeding in stock for the fat market.

The next point to be considered is the effect of artificial feeding upon hadding stock—that is, stock that is to be kept on for a number of years—and we state at the outset that the injurious effect of artificial food upon the class of stock comes annually under our notice to a great extent. The question naturally arises, if artificial food has no injurious effect upon stock fed for the fat market, why does it injure hadding stock? The answer, we think, is obvious, at least, to the practical man. The former is fed off and slaughtered in a short space of time, and always kept in a progressive state; whereas hadding stock are subjected frequently to sudden changes of food, at times fed as high as if they had been intended for the fat market, and at other times left to their own resources to pick up whatever they can find upon some barren hillside or bare grass field. This treatment, combined with the usage hadding stock meets with, often tra-

velling great distances to and from markets, subjected to sudden heat and cold, and often suffering from hunger and thirst, has a great effect in producing disease in animals highly fed with artificial food. Let us, however, endeavour to prove these assertions. There are no animals that artificial feeding is carried to such an extent as with rams for sale. Let us take, for example, the Edinburgh and Kelso ram sales, especially the latter, which is chiefly composed of Leicesters. View them on the morning of sale in the pens at Kelso, and they present the most splendid exhibition of Leicester rams that can be seen. There is scarcely a pen of rams exhibited which is not in the highest state of condition for the butcher. The high price which Leicester rams has of late years attained enables breeders to feed liberally with artificial food, and generally there is a large profit left for the breeder. The case, however, is in many instances very different with the buyer. There is scarcely a farmer that buys to any extent at these sales that does not loose several rams, and we have known instances of farmers loosing, in less than three months, the half of the entire lot bought at Kelso. The most fatal period is generally from eight to fourteen days after the rams are purchased and brought home. Inflammation of the lungs is generally the disease that cuts them off at that time, in spite of every precaution being taken in conveying them home, such as training and carting from the sale pens, and feeding them with the same kind of artificial food, or as nearly the same as can be ascertained. There is no doubt that the overfeeding with artificial food, combined with the irritation they are subjected to in the sale pens and on their way home, is the cause of the disease. And this is not the only loss buyers are subjected to, as many of those that live, and of far the best and highest priced rams, fail to get stock. This can easily be accounted for. The rams are in such high condition when turned to serve the ewes that they are scarcely able to leap them, and they heat themselves to such an extent that they are unable to serve them properly. Overfeeding in rams is greatly cried down by stock farmers, at least those that are not breeders. Still it is generally the rams that are best fed, best dressed, and best brought out that brings the highest price in the sale ring. High feeding hides a great many imperfections in sheep. It enables the wool to grow stronger and better, so that they can be clipped and dressed to any shape the operator chooses. So much is this the case that we have heard an eminent breeder remark that if a ram had a proper head and legs he could dress the body into a perfect mould. Although overfeeding with artificial food is the cause of great losses amongst rams, it is equally clear, on the other hand, that a little artificial food has a great effect in preventing many diseases young rams are subject to, and keeping them in a thriving,

healthy state. It is a fact well-known to breeders, that rams are more difficult and delicate to rear than the female sex, and artificial food ought only to be given as a variety, and not to force them rapidly into condition for the butcher. When artificial food is given to rams in small quantities we have never known it deteriorate them in after life.

Although artificial feeding is carried to the greatest extent in rams for sale, its injurious effects are often felt in other classes of sheep stock for sale, such as hogs for grazing on mountain pasture. At Lockerbie market in the month of April, and at Lanark in the month of June, especially the latter, which is chiefly composed of blackfaced or Highland hogs for grazing upon high upland pasture, there are annually lots of hogs to be seen that have been liberally fed with artificial food, which renders them unfit for grazing upon bare mountain pasture. The practical stockman when going to the market to purchase sees at once that such stock is unfit for his trade, but very often the amateur buyer fixes upon them, as they present a more thriving and healthy appearance at the time. It is only when they are driven home and turned on to bare mountain pasture that the mistake is discovered. We have known Highland ewe hogs bought at the high figure of L.45 per score, which had been liberally fed with artificial food, and as many as four fall out of each score when turned to subsist on hill pasture. High feeding with artificial food is very apt to cause heaving and inflammation of the womb in lambing ewes. We have known instances where this has been the case to a severe extent, and when the feeding was withdrawn the disorder ceased. High feeding with artificial food is also dangerous for cows in calf, and is apt to cause milk fever after calving. This occurred largely one year amongst mountain shepherds' cows, in a limited district, where a great many fell from the above disorder. Shepherds in a great many mountain districts have only a limited supply of hay or straw for the winter keep of their cow, consequently artificial food is often liberally had recourse to, such as Indian corn meal, cake, or bran. We accidentally met a distinguished veterinary surgeon of large practice at a fatal case of milk fever in a shepherd's cow. Although we were always of the opinion that high artificial feeding had a great influence in producing the disease, we put the question to the veterinary, "How do you account for this disease falling so heavily on the poor man's only cow, whereas farmers with large herds do not suffer nearly to the same extent?" He replied, "You poor men are more apt to make a pet of your cows in the shape of extra bites and dainties." This fact is clearly proved in dairy cows in large towns, where artificial feeding forms a great part, if not the half, of their keep. Few of them live to any age. One year and six months

generally sum up their days, and a great many do not see the half of that time. It is admitted by many that unwholesome byres, and the neglect of sanitary laws, is the cause of so much mortality amongst dairy cows, and there is no doubt that pure air is highly valuable both for man and beast, but we have seen milk fever prevail to as great an extent amongst cows in small dairies in the country under the pure atmosphere, as when cooped up in the dingy closes and smoky air of large towns. The cause, we think, is quite plain. Pasture during the summer and winter keep, such as hay, straw, and turnips, are very difficult to be obtained by the town dairyman, and he knows well that as large a quantity of milk, although not of the same quality, can be produced from cows fed highly with artificial food, consequently such food forms generally half of their keep, both summer and winter, hence the cause of the disease. The agricultural horse furnishes another example of the danger of cramming with large quantities of artificial food. It was the practice of late years amongst a great many farmers in our district during the winter and spring months to give their horses large pailfulls of artificial food in the evening, and when this practice was had recourse to disease prevailed. Since this system of feeding was abolished, horses upon all farms that the writer is acquainted with have been much more healthy. We think, therefore, it is clear, that however valuable artificial food may be to the stock farmer, there is a danger of using it to excess, and violating the laws of nature, by feeding our animals too much with artificial food, which are intended to live upon vegetables.

### ON THE CEDRUS DEODARA.

By ROBERT HUTCHISON of Carlowrie, Kirkliston.

[*Premium—The Medium Gold Medal.*]

*Cedrus Deodara* (London), the Deodar or Indian Cedar.

Synonyms—*Abies Deodara*, Lindley.

„ *Cedrus indica*, De Candolle.

„ *Pinus Deodara*, Roxburgh.

*Leaves*.—Evergreen, three-sided, needle-shaped, acute-pointed, pungent, very glaucous, and measuring from 1 to 2 inches in length; those on the larger and lateral branches being clustered in tufts or whorls, containing from 30 to 60 in number, on short and numerous branchlets, while those upon the young shoots are solitary, alternate, and scattered along the twigs. They are very glaucous when young, but lose this appearance as they become older.

*Branches*.—Irregularly placed along the stem, stout, and much divided, very flat and horizontal, the lower tiers being considerably deflected and close to the ground. When young, the general habit of the tree is drooping and exceedingly graceful, but as it attains to age the principal branches



assume a stiff and horizontal flat appearance, resembling more the tree commonly called *Cedrus Libani*.

*Flowers*.—The Deodar flowers in September, and the seeds are ripe in October or November of the following year. The male catkins are solitary, numerous, erect, from 2 to 3 inches long, oval at first, but gradually becoming cylindrical; the majority of these, and of the female flowers, are produced on separate trees, although a number of trees produce both male and female flowers on the same individual.

*Cones*.—Erect, solitary, on the upper side of the principal or stout top branches, ovate, obtuse, or nearly cylindrical, from 3 to 5 inches long,  $2\frac{1}{2}$  inches wide, slightly depressed at both ends; of a rusty brown colour, and when fully ripe the seeds are shed along with the scales upon the ground, the cones breaking up and falling to pieces.

*Scales*.—Closely imbricated when young, but deciduous when fully ripe; broad, thin, smooth, and entire on the margins, of a bluish colour at first, but rusty brown when matured, and abounding in resinous matter on the outside in numerous transparent lobes.

*Seeds*.—Wedge-shaped, soft, and full of resinous turpentine; wings obovate and membranaceous.

*Habitats*.—The Himalayan mountain ranges, at an elevation from 5000 to 12,000 feet above sea-level.

THE *Cedrus Deodara* may be looked upon as the pioneer in this country of that now numerous class of plants commonly known as the "Newer Coniferæ." Its majestic appearance in its native habitats, where, amid the snows which crown the loftier ranges of the Himalaya, it attains a size almost equal to that of *Wellingtonia gigantea* of the Californian woods, at once attracted attention, upon the opening up to the researches of the scientific world, of the Himalayan flora; and the estimation in which it is held in India, as a profitable timber tree, further combined with its reputed hardihood, to render it at once an object worthy of the utmost efforts to secure for acclimatisation of those interested in the arboriculture of the British Isles. The glowing accounts received in this country of the enormous dimensions of the *Cedrus Deodara*, its surpassing grandeur and beauty, its strength of timber, and durability when wrought up for economical purposes, its rapidity of growth and supposed suitability for the climate of Britain, all tended to predispose the minds of enthusiastic planters, ever on the watch for "*something new*," in favour of the Deodar, and its arrival in this country was accordingly hailed by eminent authorities upon arboricultural matters with the greatest satisfaction. Whether the tree has fully sustained the reputation which heralded its advent from the Indian Continent, in every respect, is a matter open to considerable doubt and difference of opinion. Upon one point, however, all authorities are agreed, and in point of graceful beauty it is universally admitted, that the Deodar has no equal. In respect of its utility as a forest tree, or *timber producer*, in this climate, it is still somewhat premature to speak with decision, as few specimens have as yet been felled and experimented with, and these,

of course, are too young to afford a fair criterion of what may be in future centuries, the value of the timber of the Deodar grown in Great Britain.

In its native clime, as already stated, it is held in great repute for its timber, and its Hindostanee name, "*Devadaru*," or tree of God, is evidence of the high esteem in which it is held. It is likewise called "*Deewar*" by the Gurhwalese, "*Diar*" by the Kashmiris, "*Deodaroo*" by the Shastras, and "*Keloo*" or "*Kelou*" by some of the tribes inhabiting the North-West Provinces of India. Everywhere, throughout British India, where it is found, it is considered as *sacred*, and it is said to be almost the only wood which resists the attack of the white ants in the East; and, indeed, so highly esteemed are its qualities in this respect, that it is said if its resin be rubbed upon any other kind of wood, it is thereby rendered less liable to decay, or to the attacks of insects. So far, therefore, as unfavourable opinions of its value have been formed in this country, these may, by-and-bye, be materially modified when older trees have been converted into timber, whose beneficial properties will be more apparent than those of the small and meagre specimens hitherto tried. There can be no doubt that, like the larch and common Scotch fir, young trees of Deodar are of little value, and of no durability when exposed to damp; but in the case of *old* timber, well-developed, and slowly grown, very different results may be anticipated. In fact, the physiological change of habit in the Deodar in its native habitats, would of itself indicate a corresponding change in the character of its wood. We are told that in the districts around Simla, where it abounds, the English residents imagine that there are really two distinct species. This difference between the older trees and their younger neighbours, arises from the fact that when the tree has attained a height of about fifty feet, the terminal shoot generally withers off, and the top of the tree assumes a flattened appearance, the side branches being correspondingly increased in vigour by the additional circulation of sap thus thrown into them; but the whole tree loses that *larch-like* aspect which it formerly possessed, and assumes more of the *cedar* habit, as we generally conceive it to be. This curious fact in the description of *C. Deodara*, in its own hill country, may perhaps account to some extent for the confusion regarding its identity with *Cedrus Libani* in this country, and to which reference will be afterwards made in this paper.

Although it would form an interesting and instructive inquiry, to quote from the history of the *Cedrus Deodara* in its native country, some particulars of its geographical distribution, antiquity, and traditions, and to give some details of its special botanical features, which tend to the conclusion that it may be considered the parent type or species, and of which the well-marked

differences in the *Cedrus Libani* and *Cedrus atlantica* are only various defined forms, while the three are practically identical, we must pass over so engrossing a subject, and proceed to notice the *Cedrus Deodara*, from the more modern knowledge we have of it in this country since its introduction.

According to some botanical writers still living, the first seeds of *C. Deodara* were received in this country in 1822; but upon this point there seems good ground for question, and the earliest authentic date which we are inclined to quote as the period when the Deodar arrived in England, was in 1829, when, through the instrumentality of the Hon. W. Leslie Melville, a quantity of fresh seeds were received. These were distributed throughout the country to several leading horticulturists, and some of the trees thus obtained are now fine thriving specimens, in such places of well-known repute as Dropmore (see Appendix No. 1), besides being also found in several of the public Botanic gardens and Horticultural Society's grounds. In North Britain we find that the introduction of the Deodar took place at the same time; seeds having sprouted, and the individual plants being still extant, thriving very well, as for example at Dysart House in Fife (see Appendix No. 2), and also in the grounds of Melville in Fife, the seat of Mr Leslie Melville's relative, as well as in other situations. The beauty and hardiness of these novelties during the early years of their growth in this country, independently of the reputation accredited to them as future timber trees, led to fresh importations of seeds in quantity; and in 1841 the Directors of the East India Company, with the intelligent liberality which distinguished that illustrious corporation during its long and honourable career, arranged for large supplies of fresh seeds being obtained and forwarded to this country, and thus a wide area of young seedlings was raised and distributed throughout the length and breadth of the land. The idea was that this new tree was destined to replace the waning supplies of oak for naval purposes, and that a wide distribution of seedlings was desired, and necessary, to cheapen the supply of it in nurseries throughout the country, for the supply of planters on every estate in the kingdom. Thus, we see, that no new acquisition to our forests and plantations had ever so fair an opportunity, or so golden a start in public estimation, as *Cedrus Deodara*. The price of seedlings in nurserymen's catalogues fell, and thousands of planters and landed proprietors throughout England and Scotland eagerly introduced the new comer; many, from a mistaken idea of its constitution, and as being the nursling of an Indian climate, placing it in situations not well adapted for its successful culture in such a climate as that of Britain. In many spots upon the Himalaya, the Deodar is found luxuriating in its greatest vigour upon the northern slopes of the mountains, where perpetual

snow is found, but ignoring this fact—or possibly ignorant of the fact—some enthusiastic planters selected sites with a southern aspect, and fully exposed to the sun's rays in winter, a time when the dense branches of the young trees might be laden with snow, and the result has been failure. So it is, that through the mistaken kindness of planters, whose botanical knowledge or geographical astuteness may be equally at fault, many a new introduction is condemned as unsuited to our climate, long ere the unfortunate victim to such ignorance or folly has had even a faint chance of being acclimatised. The result of the step inaugurated by the East India Company's Directors was this, that while in 1838, Loudon in his "Arboretum" quotes the price of seedling plants of *Cedrus Deodara* at two guineas each, we find them in 1854, quoted in nurserymen's catalogues at sixpence a piece. That the progress of the wide distribution of this tree throughout the country, and its culture in all sorts of soils, and under all sorts of circumstances, should be very rapid and great is not surprising; and we are, accordingly, able from such experience to testify to its general hardihood under any ordinary exposure for the climate of Britain. That it is perfectly hardy for withstanding the extreme vicissitudes of any usual winter there can be no doubt, and its suitability for encountering extreme seasons is well answered by its survivance of the unprecedented winter of 1860-61.

Our experience of that memorable season, points to the Deodar as being less hardy than either the *C. Libani* or *C. atlantica*; but special circumstances bring about so strong an assertion as *fact*, viz., that our area of observation for *C. Deodara* is much wider than that of the *C. Libani* or *C. atlantica*, and while the two latter cedars had been almost invariably planted in sites well adapted for plants from warmer climates, the general idea of thorough hardiness ascribed some years previously to *C. Deodara*, led to its being placed in almost any situation, regardless of suitability or otherwise. Generally speaking, we find, that in almost every instance tabulated by us, in regard to the statistics of that memorable winter,\* the younger the plants of Deodar were, the more did they suffer from the extreme severity of cold. Many very promising specimens of *C. Deodara* were killed during that trying season.

Planted extensively as so general a favourite as this tree was at first, we have the best criterion of its suitability for individual or special soils and subsoils; and it may be safely asserted, that while it has evinced no marked predilection for any distinct soil, it has been found to thrive and make progress more or less in any soil, except in pure sand. The variety of soils and combinations in which it is found to thrive in its own

\* Highland Society's Transactions, 3d series, vol. x. page 257.

country, naturally leads one to suppose that it will succeed in almost any ordinary soil in Britain, and so we find it does, as the figures and particulars in the two appendices to this paper amply testify. In situations exposed to the influence of the sea breezes, it will positively not thrive. What conifer does? And while in pure sandy soils it is anything but healthy, we find it in deep clayey loam soil, with a strong retentive clay subsoil, quite hardy, and although not making the rapid growths which we see it forming in a free open loam, upon a stronger subsoil of gravel or clay, or both combined, still it thrives; and indeed, speaking in the widest sense of our experience of the adaptability of the *C. Deodara* to any soil or subsoil, we should say that there is no tree, probably, which will flourish in a wider range of soils and subsoils than the Deodar. Situation and exposure are of more consequence to its success than soil and subsoil. Exposure to wind it cannot stand, and in southern aspects in winter or early spring, it suffers severely from the causes already referred to. In the dampest clay soils we find it thriving well, and even upon a mixture of clay and limestone it will be found to succeed fairly, where many other conifers would pine and die. Hence, for example, we find the Deodar at Balmoral, at 800 feet elevation, making little progress, in a light sandy soil and upon a gravelly subsoil. The same remarks apply to those trees planted at Keithhall, Aberdeenshire, where, in a sandy soil, trees now seventeen years old are only about 4 feet in height! In the winter of 1860-61, at Rosehall, Falkirk, many specimens of *C. Deodara* suffered severely, where grown in a sandy loam and sandy subsoil. Again, at Byran Hall, South Milford, Yorkshire, we find that Deodars do not thrive, owing to the subsoil being of white and blue clay mixed with gritty sand. In the loamy soils, whether light or heavy, and with congenial subsoils, whether of clayey nature or gravel or rock, we find that in this country, in a fair exposure, *C. Deodara* thrives very well. Thus, for example, we find it in Shropshire, in a loamy soil only about 15 inches deep, and with a sandy formation as subsoil, thriving vigorously, and now 45 feet in height, and 5 feet in girth at 1 foot from ground. In Westmoreland, near Ulceby, we again find the Deodar 20 feet in height, remarkably clean and healthy, and growing fast, even in a poor sandy soil, upon an unctuous chalk formation. In Denbighshire, it is (according to our Appendix No. 1) now about 35 feet in height, and nearly 4 feet in girth, growing in a light loam, and with its subsoil resting on the blue Welsh flagstone.

In Silha,\* in Radnorshire, *C. Deodara* is grown in large quantities, and we are able, by the kind courtesy of Captain Beavan, to give a few particulars of the growths and suitability

\* See Appendix No. 1.

of the Deodar for this locality. The specimens here are all very thriving, and make annual growths of young wood, according to the season, varying from 18 inches to 33 inches. The soil is a reddish brown loam, resting upon the Upper Silurian rock (Ludlow group), or what is termed in the district the "Mudstone." In the heavier soils, such as in a mixture of loam and clay and with a heavy subsoil, we find *C. Deodara* again thriving very well indeed at Newbattle, Edinburgh, where it has attained to a height of above 20 feet, while its girth, at 3 feet from base, is 7 feet 1 inch! In the light loams, upon a very rotten and crumbling subsoil, *C. Deodara* is peculiarly at home; and also in the heavy clay soils, with either gravel or close retentive bottom, such as marl, &c., it thrives admirably. There are, for example, at Fordel, in Fife, specimens of the Deodar nearly 40 feet in altitude, and only twenty-two years planted. The elevation above sea-level is about 250 feet. Thus, in like manner, we find in many other places, fine open areas of space in front of buildings where the *C. Deodara* may be placed upon an artificially-raised mound, and where in such sites it has been planted it has done very well. Its normal rate of growth may be fairly taken thus:—For one year's age, 1 foot in growth; two years' age, 2 feet in growth; and so on—always assuming that the tree is in a healthy situation, and that there are no peculiarities in the site or circumstance to warrant such an interference with the case as to say that it has been artificially treated.

We find, therefore, *C. Deodara* thriving vigorously in a variety of soils and situations, and for fuller details we must refer the reader to the two appendices attached to this paper, in which will be found a correct list of specimens of the Deodar introduced into Britain, with particulars of their ages, girths, &c.

But while we thus find *C. Deodara* in no way fastidious in regard to the soil in which it will succeed, a *poor* soil is better adapted for its proper development and return of timber, than a rich and moist soil.

The rapidity of growth in this country of *C. Deodara* is not equal to that of its actual progress in its native habitats; and hence we find, upon a close examination of our two appendices, that in proportion to their height, there is a far greater development of girth than perhaps of any other tree of recent introduction in this country.

By the slower development of timber, the quality and value of the wood should be much enhanced; but upon this point, as has been stated, there are not yet reliable data to give ascertained facts as being conclusive. Speaking generally of the rapidity of the growth of the Deodar in Scotland, it may be safely stated that in suitable situations the progress of the Deodar is nearly equal to that of the larch; and that in regard to soil, it

will be found, that where the latter tree thrives and prospers luxuriantly, there also will the Deodar be found to succeed admirably. Exposure to wind is highly detrimental to the progress of the growth of the plants themselves, and also to their general acclimatisation in this country.

Another cause of failure with the Deodar in certain situations arises from trying to plant them in the neighbourhood of rivers and beside streams. In such situations the trees are certain to be nipped by the spring frosts, and will lose leading shoots and many young twigs annually.

In most cases in Britain, whence reports are obtained as to the suitability of the Deodar for various soils, &c., the information received is an account of individual trees or specimens. Now we do not, in their native habitats, find *C. Deodara* growing in isolated positions, or even in groups of small area, hence it appears that in almost every instance in which the Deodar is grown either as a single specimen, or in small groups, it is inimical to its full development and future value.

Were the Deodar planted upon a hillside, in a good site in close plantation order (say 3 feet apart), we should soon see a very different habit and rapidity of growth, and at the same time some of the time-honoured ideas of planting these newer acquisitions in separate positions apart, fully abandoned. Were they planted when young in closer order, and thereby "drawn up" and self-pruned, so as to form leaders early, we doubt not that many of the objections taken to their suitability to our climate would be overcome. In most cases, of course, owing to the nurserymen's prices for these newer Coniferæ, the planting of them in anything like quantity is absolutely prohibited; but in the case of the Deodar it was different, and early in the era of the introduction of this tree ample opportunities were afforded for planting it in large quantities, and in every variety of soil and exposure. Had large groups or plantation squares been filled with the young plants of *C. Deodara*, instead of merely planting them in isolated positions, we doubt not that at the present day in this country we should have had many more favourable accounts of the progress of the various specimen trees and others than those now reported upon.

In their native habitats the Deodars grow in close proximity, and in this way they become, in great measure, self or nature-pruned, and are induced to throw up leading shoots where otherwise they might not do so; while in almost every instance in this country, where the *C. Deodara* has been planted, it has been placed in an isolated position, or among nurses of other species than its own, and hence it is possible that it may have been so changed in physiological character, that it is even now undergoing in this country a change of habit. Whether that be for the

better or worse, it is for future generations in their experience to tell.

One peculiarity of *C. Deodara* is its liability to die suddenly, from what cause has not yet been ascertained; but in 1871 this feature was generally observed, and we attribute it to the previous very dry weather, accompanied by the drought of the previous summer, and intensified as these effects were by the drought of 1869. There can be no doubt that the effects of three successive dry seasons upon any tree, only recently acclimatised, would tell severely upon its general progress, and it is possible that the effects, which in 1871 in various situations, were apparent in the Deodar, were caused by such influences. Hence it may be assumed that, although in many varied soils and exposures and situations, the Deodar has been fairly introduced and acclimatised in this country, there are yet peculiarities of climate and culture to be overcome to render it really *in every respect*, and in every situation and circumstance, a thoroughly reliable hardy tree.

The propagation of *Cedrus Deodara* is very simple; it grows readily from cuttings, layers, grafts, and buds, and has been extensively cultivated by all these various methods; but really the only truly successful mode of propagation, and in the end the most economical, is to grow the plant from seeds sown *in the locality, in home nursery ground*, where the trees are ultimately to luxuriate. Although many examples occur where plants grown from grafts or cuttings are flourishing most luxuriantly, and upon testimony not to be readily thrown aside (such as that of Mr Fowler of Castle Kennedy), we have to admit that even *fine specimen plants* can be grown from such a process, equal in every respect to the seedlings grown from seeds, still there can be no doubt that plants or woods grown from seedling Deodars are infinitely preferable to merely artificially created trees; and therefore we must give our adhesion most distinctly to the dissemination only throughout the country of genuine *seedling* trees, if the Deodar is ever to have a fair chance in Britain of becoming a truly valuable timber tree.

Regarding the prospective value as wood in this country of the *Cedrus Deodara*, it is very difficult to offer any exact opinion at the present stage of development of its timber. Highly satisfactory accounts, on the one hand, have been received regarding its value; while, on the other, many are disposed to survey its likelihood of being ever a great timber tree with much distrust. So far as things have yet gone, it would appear that the *Cedrus Deodara* may be regarded as a second-class wood, which may rise with additional culture and due attention to acclimatisation into a first-class forest tree. One physiological feature in the Deodar leads to this belief. The pendant leading shoot so pecu-



liar to it in its younger state, and so common a distinctive mark of many of the Himalayan trees, changes its direction year after year, gradually revolving, and making one complete revolution in three years. It thus ascends like a screw, and thereby tenacity of grain in the "reed" of the wood is secured,—a fact which has been evinced by the proved resistance of timber planks of Deodar subjected to the strain of a heavy weight suspended from them. For we find that the Deodar wood broke under a strain of 448 lbs., while a plank of the same size of the *Cedrus Libani* gave way under a pressure of 378 lbs. The quality of the wood produced from *Cedrus Deodara* grown in this country may be materially enhanced by the selection of favourable sites and soils for its growth; and although it will do fairly in almost any soil, it exhibits a preference for rich loam or sandy clay soil. It is essentially requisite that the subsoil be *open* if good timber is expected. Such subsoil must be above the rise of water, which, however, should be so near the rootlets that they may be able to draw nutriment from it. Although in many places in Scotland and elsewhere, the failure of the leading shoot of the Deodar seems very common in the case of trees of from 15 to 20 feet in height, it resembles the larch somewhat in this respect, and probably the growth of Indian-grown cones are more prone to evince tenderness either in this or in any other respect, than we may by-and-bye expect to see resulting from the produce of cones ripened in this country on trees acclimatised, and thereby possibly changed to some considerable degree, in point of climate and hardihood, from the condition in which the *Cedrus Deodara* is found in its native habitats.

The Deodar has not yet coned frequently in this country, and it will be interesting to note the result of the growth, appearance, and hardiness of young plants reared from home-grown seeds. These will add probably a new chapter to the history of the Deodar in Britain, and one of much importance.



## ON THE AGRICULTURE OF THE COUNTY OF CAITHNESS

By JAMES MACDONALD, Special Reporter for the *Scotsman*, Aberdeen.

[*Premium—Thirty Sovereigns.*]

GENERAL AND INTRODUCTORY.—In all likelihood the year 1874 will prove a turning point in the agricultural history of the county of Caithness. The introduction of railway communication into any county is certain to bring about great changes in the customs and industry; and the extension of the Sutherland Railway to Caithness—the adding of the last link to the great chain of railways which unites Land's End and John o' Groats—which was fully consummated on the 28th of July last, will undoubtedly exercise a healthy influence on the agricultural and other industries of that county.

Caithness forms the north-eastern point of the mainland of Scotland. It is separated from Sutherlandshire by a romantic range of hills, is bounded on the south-east and east by the German Ocean, and on the north by the Pentland Firth. It is situated in lat.  $59^{\circ}$  and long.  $3^{\circ}$ , and resembles a triangle in form. From north to south it measures about forty miles, and from east to west thirty. The area measures about 618 square miles, and is divided into the following ten parishes:—Latheron, Wick, Watten, Halkirk, Thurso, Reay, Bower, Olrick, Dunnet, and Cannisbay. The total acreage is 471,763, and the annual value L.136,885, 13s. There are 221 owners of land of one acre and upwards, their total acreage being 471,584, and value L.118,193, 10s.; and 809 owners of land of less than one acre in extent, their acreage being 179, and value L.18,691, 14s. The total number of acres under all kinds of crops, bare fallow, and grass, according to the returns of this year (1874), was 101,990; of which 87 were under wheat, 1895 barley or bere, 33,071 oats, 70 rye, 27 peas—being a total under grain crops of 35,150 acres. The acreage under green crops was 16,746—being 14,045 under turnips, 2190 potatoes, 1 mangold, 78 cabbage, Kohl rabi, or rape, 442 other sorts of green crop. The permanent pasture measures 21,567 acres, and the mountain heath, moor, and flow-moss, 332,460 acres. There are upwards of fifty small lochs in the county, which, with the rivers, cover 9000 acres.

The general profile of the county is bare, undulating, and devoid of natural attraction, and there are no high hills throughout the broad expanse. Along the borders of Sutherlandshire, and more especially at the southern end, a few hills tower up to a moderate height. The principal of these are Morven, the Maiden Paps, the Scarry Ben (or "three hills"). The highest eminence in the main trunk of the county scarcely rises 400 feet above the level of the sea. The flat and uninteresting aspect

of the county is rendered more striking by the almost entire absence of wood. There are altogether only about 400 acres under wood, and in making up this extent a large number of small patches which have been planted by proprietors in close proximity to their residences are taken into account. The stranger who visits the county in March or May, when the cold blasting winds, which frequently play such havoc with the young crops at that season of the year, are pursuing their sweeping and undisturbed course over the county, wonders at while he laments the absence of sheltering forests. He is still more astonished when he glances at the expansive moorlands all around, presenting unusual temptations to planting. The Caithnessian informs him, however, that wood will not grow in the county, that the climate is too cold, the spring winds too bitter for the young plants, and the soil quite unsuitable, even though the climate were ever so genial. The trees, when protected from the northern blast, will grow moderately well so long as the roots are confined to the loam or *till* clay; but as soon as they begin to pierce the subsoil their lateral extensions are impeded, and death or a dwindling career follows. These are the principal objections advanced against the suitability of Caithness for growing timber; but there are others. Not a few hold that wood encourages mildew, and therefore they consider it would be damaging to the county to introduce it. I admit there is much truth in all of these arguments, but I am of opinion that wood might be got to grow, at least moderately well, in the county, and all the mildew the wood would encourage, when planted at a proper distance from the arable land, would be of less moment than the obviating of those horrid blasts which the Caithness farmer has to contend with. It is quite evident that pretty extensive planting would be most beneficial to the county, and were it planted at great enough breadth, it would grow fairly well, while the mildew theory seems open to doubt. The existence of a number of forests would have a benefiting effect on the climate, which would be an inestimable boon.

The vast breadth of peat moss indicates beyond doubt, that at one time the county had been covered to a great extent by wood. In the process of peat-cutting, trunks of birch, hazel, pine, and other trees are frequently found, and in some cases are still almost wholly entire. Many of these roots bear marks of fire, which is accounted for by the fact that the aboriginal inhabitants of Europe had to burn the trunks of trees which they wished to fell. The most remarkable evidence of ancient woods in Caithness is found in the Bay of Keiss, where lies between the links and the land, and running down under the sea, the remains of a submarine forest.

As already indicated, the extent of peat moss in the county is

very large. It has been estimated at 50,000 acres, at an average depth of 3 feet. The whole of the cotters, the small farmers, and a number of the larger holders of land use peat alone as fuel, but a few of those who are situated at some distance from the moss banks use coal. The quality of the peats obtained is very good indeed. They vary from a brown sulphurous foggy nature to a fine hard black, and when the varieties are mixed they make an excellent fire. The cutting or "casting" of the peats is generally done in May, and they are carted home at dull periods during the summer.

Though devoid of interest to the poet or artist, Caithness presents rich attractions to the botanist. The native plants and ferns are numerous—upwards of 400; and among the many species of wild flowers are the bird's-eye primrose, the blue-bell, the fox-glove, and the white flower of Parnassus. Fruit is grown extensively in some of the finer gardens, but the county is not one of much note in this way.

There are no rivers of great size in the county. The principal ones are the Thurso, the Wick, the Berriedale, the Forss, the Dunbeath, &c. The rod fishing on most of these rivers, as well as the small streams, is good. The most reliable authorities say, that the Thurso is one of the best angling rivers in Scotland—in early spring, especially, it is excellent. It is the property of Sir J. G. Tollemache Sinclair, Bart. of Ulbster, M.P., and is let to Mr Dunbar, Brawl Castle, who has of late been carrying on very successful experiments in rearing salmon, &c. Mr Dunbar allows sportsmen to fish with the rod on certain conditions, and even affords accommodation for their families in his castle. As many as nineteen salmon have been caught by a rod in one day on this water.

The lochs number close on sixty, and a few are of considerable size—the principal ones being the Lochs of Watten (3 miles by  $1\frac{1}{2}$ ), Calder, Loch More, Hempriggs, Wister, Stempster, &c. Within the parish of Halkirk alone there are no fewer than twenty-four lochs. Most of these lochs abound with sea and loch trout, of from one to four lbs., and excellent sport is generally obtained. The loch of Dunnet, or St John's, was greatly famed in olden times for its supposed virtues in healing all kinds of chronic and lingering disorders, but the enlightenment of modern times has dispelled the superstition.

The county, in an ordinary year, yields fair shooting, but game-preserving is not much to complain of. A good many of the larger farmers hold the game as well as the land, while others enjoy a joint right with the proprietor to shoot hares and rabbits on their farms. The game question is happily no matter of difference between landlord and tenant in this county. The greater number of proprietors who preserve their game in Caith-

ness, let their shootings to sportsmen—chiefly Englishmen. The rents obtained are usually pretty high, and in such a season as 1874 the lessee must have had a dear bargain. On one shooting about the centre of the county, every bird that was killed cost the lessee upwards of four guineas. Disease destroyed the birds in hundreds. In many cases the sportsmen did not go once over the moors, and I believe I am not under-estimating in laying down the total number of grouse shot in the county during the season at 1000 brace, the average yield of ordinary years being about 30,000 brace. Hares are much scarcer than they were some years ago, while rabbits are but too plentiful. The introduction of hedges fosters the spread of these destructive creatures. Some years ago, the Duke of Portland, who is now the largest proprietor in the county, turned an extensive and very valuable sheep-walk on his estate of Langwell, at the southern end of the county, into a deer-forest. The stock of deer is now very good, but his Grace has never yet fired a shot in the forest. His friends visit the place generally every season, and enjoy excellent sport. The deer are heavy, and thrive well. They frequently leave the forest and wander all over the county, sometimes as far as Cannisbay, at the extreme north-eastern point. A few of them of course never return to their wild abode; but, comparatively speaking, his Grace has little room for complaint in this way. The farmers, however, in the neighbourhood of the forest frequently suffer damage from inroads by its denizens.

The weights and measures of Caithness have been the standard ones in Scotland since the days of David II. By the "*Regiam Majestatem*," ch. 14, "It is statute be King David that ane comon and equal weight, quhilk is called the weight of Caithness—*pondus Cathaniae*—in buying and selling sall be kepted and used be all men within this realm of Scotland." This, however, is not to be wondered at, when we remember that Thurso was formerly the great mart for trade between Scotland and Norway, Sweden, Denmark, and the powers of the Baltic. Originally the farmers used the half-firlot measure,—equal to two pecks,—of which they gave eight fills for a boll of bere or oats, the vessel being heaped in measuring corn, and "straked" by the roller in measuring meal. Up to the passing of the present Act, the regular corn measure of the county was either by firlots or half-bolls. The firlot contained one bushel and a half and three quarts Winchester measure, *i.e.*,  $7\frac{1}{2}$  per cent. above the standard. Bere, oats, and malt were measured by this standard; but the boll of wheat was understood to be only two-thirds of the bere boll. Oatmeal was sold by the boll of 136 lbs. Dutch, or  $8\frac{1}{2}$  stones, and the beremeal at 9 stones, or 144 lbs. The Dutch pound was  $17\frac{1}{2}$  ounces avoirdupois. All liquids, the

produce of the county, were measured by the pint of 18 gills, or  $\frac{1}{8}$  above the regular standard, but the pint of spirits was 16 gills. Wool was sold by the stone of 24 lbs. Dutch.

Up to the passing of the Reform Bill, Caithness was joined to the Isle of Bute in political representation, and each county elected a member alternately. Then it was made a separate constituency, and is at present represented by Sir J. G. Tolle-mache Sinclair, Bart. of Ulbster. Wick, along with Kirkwall, Dingwall, Dornoch, Tain, and Cromarty, returns a member, the present representative being Mr John Pender. From 1756 to 1807, Caithness and Sutherland were conjoined as one sheriff-dom; but since the latter date there has been a sheriff-depute in each county.

This county is rich in antiquities, ancient castles, and handsome residences—some of them new, and many the work of centuries back. The ruins are numerous and historically very interesting, many of them having been the scenes of dastardly outrages and bloody encounters. There are within the county many of those peculiar structures known as Picts' Houses. These are generally circular in shape, from 8 to 10 feet of wall thickness, and surrounded by a deep ditch and rampart. Many of the ruined castles are still in a wonderfully good state of preservation.

Though Caithness is the most northern county in the kingdom, it certainly is not the least important in an agricultural point of view. On the contrary, it occupies an advanced position among counties of a similar character; a position which, however, it owes entirely to what has been done during the past half century. The improvement in the agriculture of Caithness since 1830 is something extraordinary, more so, perhaps, than that effected during the same period in any other Scotch county. This arises from various causes. The first, and perhaps most important of all, was the establishing of regular communication by sea with the south; the next, the construction of excellent public roads, the instituting of coach communication with the inland country, the natural increase of population, wealth, and general intelligence, the use of artificial manures, the introduction of superior stock, improved implements, and practical agriculturists, &c. About the middle of the eighteenth century the merchants of Aberdeen and Leith commenced to send cargoes of goods into the county, and various private companies traded with it shortly afterwards. In August 1832, the Aberdeen, Leith, and Clyde Shipping Company, on the representation of a number of gentlemen interested in the welfare of the far north, sent their steamer "Velocity" on a voyage to Wick and Kirkwall to accommodate those attending the great annual "Lammas" market. This was the first voyage by a steamer from Aberdeen

to Caithness and the Orkneys. Again, in 1833, the same company ran a steamer one voyage during the months of June, July, and August. The company began to see that trading with the north was likely to prove a profitable speculation. At first they sent steamers only occasionally, but for more than thirty years they have been trading regularly with Wick, Thurso, Kirkwall, and Lerwick. The trade has increased so very much of late that since 1869 steamers have been run twice a-week between Aberdeen and the north for four months of the year. Twenty years ago one small boat was equal to the traffic, but now three large boats are fully required. The advantages this regular traffic by sea has conferred on Caithness, and the stimulus it has given to every industry in the county, we need not expatiate on here. But though the establishing of this line of steamers was the means of bringing about an extraordinary change for the better in the county, there was still room for improvement in the communication with the main trunk of the country—there was still an urgent necessity for the introduction of the “iron horse,” and the year 1874 will be memorable in the annals of Caithness as having seen this last great desideratum supplied.

POPULATION.—The census of 1871 gave the population at 39,992. In 1801 it was 22,609; in 1811, 23,419; in 1821, 30,238; in 1831, 34,500; in 1841, 36,343; in 1851, 38,709; and in 1861, 41,111. Thus, between 1801 and 1861 there was an increase of 18,502, while between 1861 and 1871 the population decreased by 1119. It is worthy of mention that, if the census were taken up in July or August, instead of in the spring, the population of this county would be materially different, as at that period of the year the fluctuating element of the fishing population is at its maximum. In 1831 there were 6036 inhabited houses; in 1841, 6955; and in 1871, 7474. Of the families in the county, which number considerably upwards of seven thousand, about three-fifths are employed in agriculture, fully one-fifth in trade and handicrafts, while the remainder could scarcely be classed under any head.

Perhaps there is no feature of Caithness concerning which more ignorance exists than its ethnography. Many loosely indulge the notion that it forms part of the Highlands of Scotland, and that it is peopled with a Celtic or Gaelic-speaking race. True, a portion of the community is of Celtic blood, but by far the larger portion belongs to the great Norse branch of the Teutonic family. A glance at the topographical nomenclature of the county will at once solve the question of its ethnography—the ever-recurring locative affix “ster” sufficiently demonstrating the fact that the Scandinavians had settled in the county. Whether in point of bodily physique or of mental capacity, the average Caithnessian of the present day is second to no other



variety of the Scot. The men generally are healthy, well made, hardy, and active, while the women have an exceedingly attractive appearance. Writers frequently differ in various characteristics of Caithness, but all agree in paying a well-merited compliment to the female portion of the population. Speaking of the Caithness female field-worker, Mr Campion, in his report to the Commission on the Employment of Women, Young Persons, and Children in Agriculture, says—"Her physique is magnificent, and when dressed for the field in a short rough skirt, with a thick warm shawl wrapped over her head and forehead, and crossed over the breast, she looks as if she might have ranked with those daughters of the plough who formed the Amazon body guard of Mr Tennyson's 'Princess,'—

' Stronger than men,  
Huge women, blowzed with health and wind and rain,  
And labour.'"

The peasantry are an industrious, independent, well-behaved class; while the farmers are well-to-do, shrewd, practical men, with a decided turn for business, in the transaction of which they are cautious and far-seeing. Though not of a speculative turn of mind, many of them enter largely into business, and invest their money in well-considered, judiciously planned schemes. The mental powers of the Caithnessian have long been famed, the older men and women being especially proficient in what is known as "mental arithmetic." A strong clannish feeling still exists in the county, though time is gradually dispelling it. The inhabitants seldom marry strangers, and this is fortunate, for the introduction of Southern blood seems to drown the characteristics of the race. Some twenty years ago Gaelic was spoken pretty extensively in the higher parts of the county; now, however, very little of this language is spoken even there. Since the beginning of the present century there has been an immense improvement in the social habits of the people. Riots and fighting—sometimes parish against parish—were at one time of frequent occurrence at markets and other public meetings; now, however, affairs have greatly changed for the better. Indeed, I may safely say, that there is not at the present day a more peaceful county in Scotland. Generally speaking, there is a very strong desire among the old people throughout the county to bestow a good sound education on the rising generation. In consequence of the large size of some of the parishes, the parochial schools were totally inadequate for the requirements, but they were supplemented by schools belonging to the General Assembly of the Church of Scotland, to the Society for Propagating Christian Knowledge, and to the Free Church. Some of these, however, were places of an inferior standing, as may be inferred from the fact, that the emoluments in a few of them

averaged from L.3 to L.4, including fees. Lately, however, a decided improvement has been effected in the greater number of the schools, and now that the new Education Act has come into operation, the educational machinery in Caithness will be of the first order. The school rate will undoubtedly be high in this county, as a comparatively large number of additional schools will be required, on account of the widely-spread nature of the population in some of the parishes. Some fifty or sixty years ago smuggling was prevalent, but for several years this practice, as well as poaching, has been comparatively unknown. On the subject of population, it may be remarked incidentally, that Caithness long boasted of purity in the matter of illegitimacy. The comparatively immaculate character of the county in this respect has been assigned to various causes more or less charitable. One class of theorists seek an explanation in the large proportion of the fishing population, a class of people proverbially accredited with antenuptial purity; while a somewhat less charitable hypothesis says, that the traditional discredit arising from the long-sustained exercise of the ecclesiastical whip counts for an element. The censure-stool, on which in former times offenders were made to sit out a long sermon, in delightful anticipation of a public rebuke from the pulpit at the end, is said to have been an institution in Caithness long after the practice was abandoned elsewhere.

**GEOLOGY—Soil.**—The geographical formation of Caithness is of no little interest, and has been commented upon by several able writers, who have explored the county in quest of fossilised deposits. The Old Red Sandstone, which has been declared to exist all over the country north of the Spey by Hugh Miller, abounds extensively in Caithness. The principal rocks in the hilly district all belong to this formation. In many parts of flatter grounds the underlying rock is a clay slate or flagstone, which consists of a formation of alternating beds of silicious and calcareo-silicious flagstone or slate-clay, dark, foliated, bituminous limestone, pyritous shale, sandstone, &c. This deposit varies very much in depth. In Reay parish the primitive formations are granite, syenite, horn-blende, gneiss, and quartz rocks. On the estate of Sand-side, now the property of the Duke of Portland, in this parish, a bed of limestone was discovered in 1802. The bed, which dips to the north-east, is on an average about ten feet thick, and the stone is of superior quality. This important discovery was taken full advantage of, and a very large amount of lime was quarried and burned for use in the cultivation of the soil. The work, however, for some reason not well known, has been discontinued. Freestone also abounds in this parish, and has been quarried in large quantities. Generally speaking, the strata throughout the county lie from north-east to south-west, but the interruptions

are very numerous. In a few cases the stratal dip is found to lie in a westerly direction, and where this occurs the physical character of the surface differs from the other parts of the county. The soil varies from a light sandy nature to a rich loam. The predominating kind is a close retentive clay, produced by the decomposition of clay-slate. In the upland parts there is a heavy coating of moss, varying from ten inches to twenty feet in depth. Almost everywhere throughout the county the subsoil is excessively stiff and adhesive. It is in some cases mixed with gravel and fragments of semi-decomposed slate. This close character of subsoil, which is said to be the chief hindrance to the growth of timber, necessitates very careful draining before cultivation can be carried on successfully, and in some cases the horizontal rock lies so near the surface that the cutting of drains is a matter of extreme difficulty. In many cases the rock is covered by only from 14 to 20 inches, and in such cases the pipes have to be embedded in the slate, which entails extra labour and increased expense. The lighter land of the county is very fertile, and though not suited for growing crops with piercing roots, it generally produces excellent returns of oats, turnips, and potatoes. When dry it is not very difficult to cultivate, but for some time after a heavy fall of rain, or in early spring, it is next to impossible to work on some fields, as the close retentive nature of the subsoil keeps the water on the surface, and thus, when stirred, the soil becomes like mortar. Agricultural operations are frequently much impeded in this way. Superior draining, however, is working a wonderful change. The greater portions of the clayey formation consists of what is known as boulder-clay, with numerous interesting shell deposits.

Minerals are not very numerous. Traces of a coaly substance were discovered in a moor near the Crown lands of Scrabster, and a search was made, but the attempt was unsuccessful. A thin stratum of coaly black stone was found on a level with the sea, which burned with a clear flame for some time, but was not reduced to ashes. A slight seam of coal was also discovered in the parish of Halkirk, but there were no indications of any great quantity of deposit, and therefore no investigations were made. Lead ore exists in small quantities. About a hundred years ago an English company employed two men for a season at the Hill of Achinnarras, working pits or shafts for this mineral; but though the quality was found to be good, the limited supply necessitated the abandonment of the work after a few tons had been extracted. Some solid pieces of lead ore were discovered on the Barrock property while drains were being cut, but otherwise only small pieces of this metal have been seen. Iron ore is to be found all over the county, though a sufficient quantity of it has not been discovered in any one place to induce mining.

Sir Robert Charles Sinclair a few years ago commenced digging on his estate of Dounreay, in the parish of Reay, and without going to a great depth, several hundred tons were got. The percentage of the ore was high, but the seam was so small and irregular that it was deemed prudent to discontinue the operations. The fissures in the laminated bed of the rock formation are in some parts filled up with trap and quartz or felspar. Veins of copper ore also run through the county, and upwards of one hundred years ago a company of miners dug for it in the parish of Wick, and succeeded in obtaining several ship-loads of the ore. Marl is abundant in a number of the lochs of the county, and is used by farmers in lieu of lime.

CLIMATE.—Considering the northern latitude of Caithness, the climate at first appears wonderfully mild. A glance, however, at its comparatively insular situation prepares one for the absence of extremes of temperature that characterise large continental areas of country. But the comparative mildness of the winter is to a great degree attributable to the mellowing influence of the Gulf Stream. This great thermal ocean river, incessantly flowing from warmer to colder regions, diffusing warmth and moisture along its course, and temperating the climate of countries that lie within its influence, impinges against the north-western coast of Europe. A current of it strikes at a point near Scrabster in this county. In view of these facts it will not be surprising that snow scarcely ever lies to any depth, and that prolonged frosts seldom occur. As an indication of the comparative mildness of the winter, it may be mentioned that the lapwings and other birds which visit most of the other counties in the north only in spring and summer, remain here to some extent throughout the whole year. The winter is becoming milder and more open in this as in other northern counties, while the number of days with frost and snow are decreasing. The plough is scarcely stopped during the whole winter, except when the land becomes so excessively wet as to render working it imprudent. For fully eight months of the year the wind blows either from the south, south-west, or west. These winds come from a warm climate, and passing over a great extent of ocean, are charged with moisture, and produce rain. Hence the rainfall of Caithness is pretty high—upwards of 34 inches. The fall of rain is pretty equally distributed over the twelve months; the average number of days in the year in which rain falls is about 190, that with snow about 36, with frost about 35, with fogs 35. In spring, especially during the months of March and May, tremendous blasts blow from the east. These east winds sweep uninterruptedly over the county in terrific fury, damaging crops and young plants of every description. They are perhaps the sternest enemy the Caithness farmer has to contend with, the

damage done being sometimes excessive. Strange to say, April is generally considerably milder than either March or May, and it is seldom that much destruction is done by bad weather in this month, though the wet condition of the land at this time frequently retards agricultural operations. High winds also often prevail in the harvest time. What are known as the equinoctial gales generally visit the county with great severity from the 16th to the 22d of September, and usually continue over the greater part of three days. Experience has taught farmers to exert every possible effort to have the whole of the grain crop off the root by that time. When a portion of it remains uncut, which frequently happens, considerable damage is done by shedding or shaking.

The electrical condition of the atmosphere is equable, thunder being seldom heard; a coincidence with a flat treeless surface that the as yet unreduced state of meteorological laws fails to pronounce either chance or significant. The climate of Caithness is extremely healthy, both for man and beast. Epidemics are of rare occurrence. It is very seldom indeed that farmers lose horses or cattle by disease of any kind. Potato disease seldom occurs, but turnips suffer now and again from finger-and-toe. Mildew also does considerable damage. The great number of lochs which exist in the county increases the mildew, and I am of opinion that the climate would be very materially improved were at least one-half of these lochs drained. Lochs are constantly evaporating, and in dry soils they serve to temper the aridity of the district. In a county of so wet a character as Caithness little of this is required, and the influence the lochs have is unfavourable. As a property the minute watery vesicles rise from the lochs on the operation of the heat of the sun, and are diffused over the surrounding land in an invisible state. When affected by cold these vapours become visible, and constitute fogs and mists. Fresh water is considerably more susceptible of evaporation than salt; and hence where fresh-water lochs abound, mists are more frequent than where the land is surrounded by salt water only. As substantiating what has been said on this subject, I may state a case of some interest. The farm of Lochend, in the parish of Dunnet, lay between two lochs—Seister and Haellan—when the present occupier, Mr James Purves, obtained a lease of it in 1851. At that time hazy mists were frequently observed passing from the one loch to the other, and the farm was usually one of the latest in the county. Some few years ago the spirited tenant drained the loch of Seister,\* which lay on the north-east side of the farm, and since then a marked improvement has taken place in the climate of the locality. Mists are not nearly so frequent, and the crops are ready for the reaper earlier than they used to be. The improve-

\* See report in Transactions, vol. ii., fourth series.

ment in the drainage of the county has counteracted the unfavourable influence of the lochs considerably; but yet farms in the neighbourhood of lochs are subject to mildew. The farm of Dun, which is occupied by Mr Henderson, and which lies on the south-west side of the loch of Watten, was at one time so subject to this blasting element, that the cultivation of it was partly given up, and it was turned out into a sheep run. Since Mr Henderson obtained his lease twenty years ago the land has been thoroughly re-drained and broken up again, and now it is not much worse than other farms in the same locality. The draining of the loch of Watten, for instance, would, I am convinced, improve the holdings around it.

ANCIENT FARMING.—The exact extent and true character of the improvements that have taken place in the agriculture of Caithness during the past twenty-five years, can be properly known and understood only when some slight acquaintance is obtained with the state of matters previous to 1849. A brief account of the ancient system of farming will therefore be interesting. Previous to 1780 the agriculture of Caithness was truly in a state of primitive simplicity. When the great tourist Pennant visited the county in 1769, affairs must have been in a wretched state. He describes the county as little better than an immense morass, with here and there some fruitful spots of oats and bere, and much coarse grass, almost all natural, there being then very little artificial grass. Caithness at that time could not boast of a single cart. Turnips were unknown. Potatoes reached the northern extremity of Scotland only in 1754. Rotation and cropping was never thought of; not a drain was dug, and not a fence was to be seen, except in the neighbourhood of the proprietors' residences. A kind of wicker basket, known by the name of "crubban," was used instead of the cart, one being hung on either side of a horse from a wooden saddle called "clibbar." These were used in the conveyance of rough material, a sort of bags made of straw, designated "cazies," being used in the carriage of grain and such commodities. These cazies or crubbans were filled to the brim, and then the horses were driven to the field or wherever the material was to be conveyed. Speaking of this subject, Henderson, in his "Agricultural Survey of Caithness," says that "six or seven horses thus loaded might be seen going in a kind of Indian file, each tied by the halter to the other's tail, a person leading the front horse, and each of the others pulled forward by the tail of the one before him. After the driver arrives at the destined place, the horses are unloaded, and the halter of the front horse is tied to the tail of the rear horse, by which means they cannot run away, as they can only move in a circle where they stand." This mode of carriage was at one time general all over the north, and the writer has frequently examined, with

much interest, the "tackle" which was used. But Pennant draws a much darker picture than the above of the mode of carriage in Caithness in ancient times,—a picture which many are inclined to think was painted not so much to represent the actual state of matters, as to make the production attractive. He says—"The tender sex [I blush for the Caithnessians] are the only animals of burden; they turn their patient backs to the dun mill and receive in their cazies or straw baskets as much as their lords and masters think fit to fling in with their pitchforks, and then trudge to the fields in droves." Women certainly had a greater share of the drudgery of the farm in olden times than they now have; but the statement, that the tender sex were "the only animals of burden" in Caithness even in 1796, seems open to doubt. The plough in use was called the "thrapple plough;" and was similar in construction to that once used not only in the north of Scotland, but in England, Rome, and Egypt. With the exception of the coulter and sock, it was wholly made of wood. Even the pins and nails were wooden, while there was only one stilt. Of course these implements were of a feeble character, and a breakage frequently occurred. This, however, was not much thought of. The making of a new plough was the work of only three or four hours; and thus the result of smashing a plough to pieces was nothing more than the "loss of a yoking"—a small matter in those days. When bought from the carpenter, the thrapple cost 4s. Four horses, and sometimes two oxen, were employed in drawing the plough, while three persons were required in attendance. One held the plough, another pressed weight on the beam to keep it in the soil, while another (generally a woman) acted as driver. With all this force, the average breadth turned over in a day scarcely exceeded a quarter of an acre. The character of the ploughing at this period was not by any means good. The furrow was usually light and not very regular, while the turning over was very imperfect. The cultivation of the soil apart from ploughing was far from satisfactory in Caithness in early days. The implements in use were of a very inferior kind, while the want of draining operated strongly against anything like successful farming. Square fields were few and far between, patches here and there of the most fantastic shapes forming the arable land. It was nothing unusual to see spots of land lying in its primitive state in the midst of cultivated fields. Stones were seldom removed; and the old axiom that "good harrowing is half farming," seems to have been totally disregarded. The finer pieces of land were fully taken advantage of. Bere and oats were sown alternately, without any intercession. The whole of the farm-yard manure was spread on these parts, while the poorer portions were turned into fallow now and again by way of rest. The ancient arrangements for letting land,

and the customs of paying rent, are so fully detailed by a writer in the "New Statistical Account of Scotland," that I quote the following extract from his remarks:—

"Each property was divided into townlands. In every town land there was what was called the Mains, which consisted of a farm, on which were a barn and a stackyard. The proprietor retained the mains in his own hand. The remainder of the townlands was divided into what were called pennylands, half-pennylands, farthing lands, and octos. These were measured out by shrewd countrymen called land-riders, or more properly land-redders, for they did not ride. In accomplishing their work they spaced six paces as the breadth of a rig of cornland, and 240 as the length. This they denominated a firloft sowing of oats. This multiplied by 4, the number of firlofts in a boll, gave 5760 square spaces, being precisely the number of Scotch ells in a statute Scotch acre. The land-redders knew nothing about surveying, nor had ever heard of a chain or of an acre; yet it must be plain that long before the memory of man their measurement must have been founded on actual mensuration by the chain. The grass land, out-field, or in arable, was assigned in fixed proportions to these different divisions; and a certain rent, varying in different townlands, was laid on the grass land; and a certain quantity of grain to be paid for the corn-land of these various penny, halfpenny, farthing, and octo lands. The townland of Papigoe, for instance, in the neighbourhood of the town of Wick, was divided into fifteen pennylands, one halfpennyland, and half an octo. Every pennyland paid eleven bolls of corn, or farm, as it was called, and no money. The townland of Kilminster was red into thirty-six pennylands, each one of which paid four bolls of farm and L.5, 6s. 8d. Scots as the rent of the grass-land. To render the state of matters still more opposed to all improvement, the custom of run-rig was common. This barbarous custom was said to have originated in times of universal and incessant feuds, as a preservative against one neighbour setting fire to the field of another, and to make the whole townland equally anxious to resist an enemy in case of an invasion. These pennylands, &c., were let to small tenants, who, besides the rent already specified, yielded an infinite variety of minute services to the landlord. The tenants of each pennyland, for instance, had to bring out their own plough, fully equipped, early in spring and plough half an acre of outland in the mains; to send a man to sow the seed; to send their harrows and harrow the ground; to send two persons to carry on the horses' back—for there was not a cart in all the parish (Wick)—the manure in straw-baskets, called cazies, for the bere-land; to lay the manure on; to send a plough and till the bere-land; to sow the seed; to harrow it in with their own harrows. In summer, to mow the natural grass,



to make it into hay, to carry it to the yard, to build it into stacks; to send a person to weed the corn; to cast four hundred feal for building houses, and three hundred divots for thatching them. In harvest, to cut down a certain quantity of corn, to carry it and build it in the stackyard; to furnish a certain number of winlins to thatch the Mains' stackyards; a certain quantity of drawn straw to thatch the Mains' houses, and a certain quantity of *simmins*—that is, plaited straw-ropes—to bind down the thatch; to thrash a certain quantity of corn in the barn, to dry it in the kiln, to carry it to the mill; to carry the meal thence to the ginel, and to ship it on board for exportation; to carry one letter in rotation to any person in Caithness; to give a certain portion of peats; to dress a certain quantity of lint; to winter a certain number of cattle; to pay one fat lamb, two geese, hens, chickens, eggs, &c. &c. The land-redders laid off to each [pennyland such a proportion of arable land as they thought would sow twelve bolls of small oats or eight bolls of bere. Of the natural grass-land assigned to each pennyland, the tenant had exclusive possession only till the corn was off the ground, when the whole again became common till the next spring. Instead of being encouraged to take in and improve any part of the out-field land, the tenants were expressly debarred from doing so, or, in the country phrase, corrupting the leases, and were prohibited from cultivating any more than the portion of corn-land which had been ridden off to them."

Matters continued without much change till about the beginning of the present century. Among the first to abolish the wretched system of land-letting referred to in the above quotation, was the late Sir Benjamin Dunbar (Lord Duffus), who succeeded his father in 1782. He apportioned his land, and abolished the middlemen, converted all the services of the tenants into money, and granted them leases at a fixed rent. By this enlightened procedure the tillage of land was extended, better modes of cultivation introduced, the rental of the proprietor increased, while the tenantry were delivered from their former vassalage, and their comfort greatly promoted. About this time a class of gentlemen arose as proprietors of whom Caithness will ever have reason to be proud. They were the late Right Hon. Sir John Sinclair, Bart. of Ulbster; the late James Traill, Esq. of Rattar; the late William Horne, Esq. of Scouthel; and Sir Benjamin Dunbar. To them, in a great measure, is due the credit of the present state of Caithness. They not only originated the improvement of the county, but carried it on to an advanced stage. In fact, it may almost be said that they turned Caithness from a wild desolate plain into a highly cultivated county, and raised the inhabitants from a state of bondage and servitude to comfort and independence.

Sir John Sinclair not only strove with unmitigated zeal to develop the resources of his native county, but also distinguished himself as a promoter of the welfare of the country generally. He, indeed, was one of Scotland's best patriots. He purchased the estate of Langwell, in 1788, for L.7000, and immediately commenced improvements. He planted a large breadth of land, and made his property one of the prettiest spots in the county, a distinction which it still maintains. Sir John was the first to introduce the Cheviot breed of sheep, a step that was in itself an era in the history of the agriculture of the county. The Langwell flock grew and prospered; and some twenty years ago the principal prizes for Cheviot sheep at the Highland and Agricultural Society's Show were carried off by them. As to the improvements effected on Langwell, it is unnecessary to say one word, beyond the fact, that in 1813 he sold the estate to Mr James Horne for L.40,000. Sir John's efforts for the good of the county were not confined to Langwell. He, as will be afterwards referred to, was the mover in the making of the fine roads which now permeate the county, and was the means of establishing mail-coach communication with the south, which was commenced in 1818. Mr James Horne, who by sheer enterprise and intelligence, raised himself from a humble position, proved a worthy successor to Sir John Sinclair as proprietor of Langwell. He improved extensively, and paid the strictest possible attention to the already fine stock of Cheviot sheep. Mr Donald Horne, W.S., Edinburgh, a nephew of Mr James Horne, obtained possession of the estate on the death of his uncle, and retained it until some fourteen years ago, when he sold it to the Duke of Portland for the handsome sum of L.90,000. Perhaps a truer or more striking example of the grand change the last eighty years have wrought in Caithness could not be furnished than that of the Langwell estate. Between 1788 and 1860, its value was raised from L.7000 to L.90,000. The late Mr William Horne obtained several small estates in the centre of the county—Scouthel, Wester Watten, Lynegar, Stirkoke, and Sybster. On all of these he made extensive and valuable improvements. In 1822 Mr Horne of Langwell was fortunate in securing, as his factor and manager, the late Mr James Purves, while Mr William Darling was brought into the county as manager of the Stirkoke property. The names of these two gentlemen will long be remembered and revered in Caithness. Not only did they most satisfactorily carry out the improvements on the estates of the Hornes, but they were also the means of spreading throughout the county a new and greatly improved system of farming. Mr Purves, who in 1824 introduced Leicester sheep from Berwickshire (his native county), besides superintending the improvements on the Lang-

well estate, carried out the reclamation of the fine farm of Wester Watten, which extends to a thousand acres arable, and which is now one of the most complete farms in the county. It was thoroughly drained, well-fenced, and squared off, while excellent houses were erected. Mr Purves, after remaining with Mr Horne for about ten years, left to superintend improvements on the estate of Rattar, belonging to Mr Traill. Mr Darling was all this while remodelling and improving Stirkoke and Mr Horne's other estates in that neighbourhood. He was in no way less experienced in the reclaiming and managing of land than his able colleague Mr Purves; and before leaving the services of Mr Horne he completely revolutionised the estates under his charge, and set down many examples well worthy of imitation.

Mr Traill, better known as "Sheriff Traill," was an earnest and most energetic improver. He was a thoroughly practical man, with a clear head, and indefatigable energy. His compact estate of Rattar was a perfect model in every way, even forty years ago. In common with every other property in the county, the system of land-letting, already detailed, was observed on the Rattar estate. Mr Traill, however, could not tolerate this state of matters. He took the whole of his estate, with the exception of a number of small crofts, into his own hands, and drained, reclaimed, squared, and fenced the land, laying it out in sixteen farms, ranging from one hundred and fifty to seven hundred acres in extent. Mr Traill then secured tenants for these farms; and to encourage them to build good houses, he supplied them with everything except wood,—the tenants, of course, performing the cartages. All these improvements were done under the superintendence of the late Mr James Purves, who acted as factor for Mr Traill for some twelve years. The system of reclaiming land was the same then as now; while almost the whole of the fencing was done by whins, thorns, beech, and flags. Among the others who took a prominent part in the early improvement of Caithness were Sir George Dunbar, Bart. of Hempriggs; the late Captain Henderson of Stempster; Sir John Sinclair, Bart. of Dunbeath; and Mr Sinclair of Forss.

No artificial manures were used in this county till after the beginning of this century. To eke out the supply of farm-yard manure, which was very limited, fish-offal and mail were tried by some farmers. The beneficial effect these stuffs had on the land soon became known, and by 1820 were used extensively. Some gave it as their opinion that the first decided start which the reclamation of waste land received in Caithness arose from the use of fish-offal and marl. The offal was easily obtained at the fishing stations, while the latter abounded in the lochs. The late Mr John Leith reported to the Highland and Agricultural Society on the reclamation, between 1824 and 1828, of a tract of

waste land near Wick, extending to 156 acres, which he leased for L.31, 6s. of yearly rent from Lord Duffus, and which he succeeded, by judicious application of fish-offal, in turning from a moory plain to fertile land. The offal was mixed with a compost of clay and moss, and allowed to lie in a heap over the winter. In early spring it was spread on the land ploughed the previous autumn, in quantity ranging from 50 to 60 cartloads per acre. For a second crop a fourth of this quantity was applied, while a third crop was obtained without any further manuring. The improvements, Mr Leith said, were attended with complete success, and in four years a large tract of land was converted from producing heath and coarse grass to corn land and fine green fields, bearing crops hardly equalled by any in the country. The marl of Caithness was analysed by the late Professor Johnston, and was found to contain nearly 85 per cent. of carbonate of lime. The ease in obtaining the marl, and the beneficial effect it was found to have on the land, led the farmers to apply too much of it, and thereby the land was in many cases completely overdone. So thoroughly overdone was the soil on some farms, that it positively refused to produce any kind of crop whatever. Some tried the application of more marl, and others resorted to fish-offal, but all was found of no avail. Time alone could remedy the mistake. One result of this occurrence was to prejudice farmers against marl as an article for manure, and for many years very little of it was used. Lately, it has been tried again in small quantities. It was to be regretted that marl was not more judiciously used, as, in the absence of lime, it has a highly beneficial effect. Lime is scarce in Caithness, and while little is used at the present day, much less was applied in former times.

As a grain-producing county, Caithness earned some fame at a comparatively early period. Bere and oats were almost the only crops grown previous to 1790. The soil is peculiarly fitted for these varieties, and even with the miserable mode of farming which prevailed in those days, very fair crops were produced. In 1695 sixteen hundred bolls of bere and meal were exported. In 1783 the exportation increased to 25,000 bolls. Up to the beginning of the present century the distilling of whisky was carried on to an extraordinary extent. There were at one time close on 90 stills in the county, and at each of these from 100 to 150 bolls of bere were consumed. This practice had a most prejudicial effect on the morals of the people, and an effective blow was given to it by the legal powers of the county. At a meeting of the Justices of the Peace and the Commissioners of Supply, held at Thurso on the 21st of May 1776, it was agreed to "discountenance, as far as in their power, the pernicious practice of distilling whisky." Previous to the eighteenth cen-

ture, ale was the chief beverage used in the county, and in 1668 no less than 1749 bolls of malt were brewed into this kind of drink. The quality of the grain grown was wonderfully good. Oats seldom reached 40 lbs. in weight, however, while barley or bere scarcely ever came within 4 lbs. a bushel of what the county produce now is. Turnips were not grown at any breadth worth speaking of before the beginning of the present century. Potatoes were introduced in 1754, but more than twenty years elapsed before they were grown to any extent.

The ancient horse in Caithness was of the Garron tribe, and was little, but firm and durable. These animals seldom exceeded fifteen hands in height, and were frequently under twelve. Scarcely any of this breed now remain. Oxen are not now used to any great extent in husbandry in the county.

The cattle, about 100 years ago, were a very hardy kind of beast, but almost the very worst to be found in any part of Scotland. They were little and unshapely. The fact that the county was so long shut out from all markets operated against the improvement of the stock. Fattening cattle was entirely unknown, and the county became so much overstocked, that the cattle were frequently half-starved, receiving just enough of straw twice a day during winter as would keep them alive, and in summer they were turned out upon the hills. It has been asserted that the number of cattle reared in Caithness fifty or sixty years ago was at least one-third more than it was capable of keeping. This system of overstocking was pursued by the farmers to enable them to meet their Martinmas demands, the commerce in cattle being their principal dependence. The first to take steps for the improvement of the breed of cattle, as of sheep, was the late Sir John Sinclair. He tried the crossing with a Galloway bull, believing naturally that the deep chest and broad loins of that breed would make up the deficiencies of the native cattle in those important parts. His experience of this cross, however, was unsatisfactory, as shall be noticed afterwards. He next tried the introduction of West Highlanders, crossing them with the Caithness cattle. By this he succeeded in materially improving the native breed. Every successive cross showed marked improvement. The progeny of Sir John's stock spread over the county, a large number of West Highlanders were introduced by other people, and since then the cows of Caithness have almost all been of Kyloe descent. Further improvement was effected by the introduction of shorthorn bulls into the county, but of this more anon. In ancient times a comparatively large number of cows were kept in the county. Dairies were numerous and extensive, and considerable quantities of butter and cheese were manufactured, especially in the summer when the pasture was luxuriant. The cows were kept

at what was called the *shielings*, i.e., places at some distance from the farm-houses where hill pasture was plentiful. "About the 20th of June," says Henderson, "the housewife and maid set out with the milk cows, perhaps ten to twenty in number, to the shielings, where a booth or cabin was previously prepared for their reception, another for the milk vessels, and a small fold to keep the calves from the cows during the night. There they passed a complete pastoral life, making butter and cheese, and living on curds and cream or a mixture of oatmeal and cream, seasoned with a glass of whisky before and after meals, dancing on the green, and singing Gaelic songs to the music of which, at milking-time, the cows listened with apparent attention and pleasure." The time spent in this way ranged from a month to six weeks, according to the supply of pasture for the cows. There are still a few dairies in the county, but the ancient custom noted above has become a thing of the past.

Up to 1820 Caithness was covered with a blackfaced breed of sheep, known as the Kerry breed. They were small and narrow in the frame, short, very unshapely, and slow in growth. The wool and mutton producing qualities were poor indeed. The fact that the ancient breed of sheep is now wholly superseded by foreign breeds—the Cheviots and Leicesters—is sufficient to testify that they were of an inferior kind. A few ewes of the old breed are still to be seen on small crofts.

The native breed of swine were small and unprofitable, slow in outcome, and scarcely ever repaid high-feeding. Probably on this account very little care was bestowed on them. During summer they ran about at large, and throughout the winter were shut up in a small dingy hut.

In early days poultry breeding was of minor importance in this as in other counties. The aboriginal hens were little and unproductive, while the percentage of eggs that passed successfully through the stage of incubation is said to have been small. Of late years this branch of rural industry has received more attention from the Caithnessian goodwives. Superior breeds have been imported, but poultry farming is not by any means likely to take a place in the agricultural industry of Caithness.

Previous to 1830 leases were almost unknown in the county. In a few cases there was a sort of an agreement between the landlords and the tenants, but the regular form of leases has been general for only about forty years. For fully twenty years after the institution of the system, the nine years and fourteen years' leases were most in favour. About twenty-five years ago, nineteen years were laid down as the duration of the leases on several of the principal estates in the county. Since then this

form of lease has been the most common one, though nine, fourteen, twenty-one, and twenty-six years' leases have been granted. The leasing system has been the means of doing much good in the county. The security thus afforded the tenants stirred them up to remodel and improve their farms to their minds. It was on the large farms only, however, that these leases were granted. The crofters have no leases yet, their tenure being from year to year. A good many of the small farmers are also on this footing, though the majority of them obtained leases some years ago.

MODERN FARMING.—If Caithness is interesting in any one respect more than another, it is in a purely agricultural point of view. To the keen agriculturist there are few counties more attractive, especially in the months of June and July. At that time the grass fields are green and luxuriant, the grain crops rich and promising, and the turnips healthy and verdant, while the great number of large square, finely laid out neatly fenced farms, with handsome buildings and excellent roads, form a perfect picture. Many of the farms are square, laid out in neatly apportioned fields, divided with hedges or dykes or flag-fences, and regularly intersected with substantially made roads, and adorned with neat good steadings and suitable dwelling houses. The general arrangement is all that could be desired. Of course these remarks do not apply to every corner of the county. The portions occupied by the fishing population exhibit an unsatisfactory state of cultivation, while on the majority of the crofts, and on a few of the small farms, there is still room for improvement. Every successive year is making these eyesores fewer in number. The fields are being squared, and the land drained and fenced. Up to the beginning of the present century, the only regular tracts of cultivated land of any size in the county ran along the seaside. The interior was mottled with small irregular spots of badly cultivated land. Here and there a farm of moderate size was to be seen, but intervening between it and its neighbours were extensive stretches of pasture land. The removal of these wastes, and the completing of the many fine tracts of highly cultivated land that now adorn the county, are for the most part due to the enterprise of the past twenty-five years. A few of the finest farms in the county are comparatively new, but, generally speaking, the old cultivated land produces the best crops. As might naturally have been expected, the best soils, and most suitable spots, were first selected for cultivation; but there was another cause that contributed to the superiority of the spots. In days gone by it was a practice among farmers to top-dress their arable land with soil from the waste land. This practice, though highly remunerative to those who pursued it, is a mistaken one, and the effect of it is being

felt now that those harried moors are being cultivated. An additional supply of artificial manure is required, and after all the crops are inferior.

The origin of the leasing system in Caithness, which dates further back than 1849, has been briefly alluded to already. During the past twenty-five years, this system, now so popular all over Scotland, has been gaining in favour in this county. On every estate in the county the larger farms are held on leases, while on several of the principal properties the small farms are also let under lease. The leases range from nine to twenty-one year's duration, the majority being nineteen. The duration of leases is generally regulated by the amount of rent and the extent of improvements contemplated. When extensive improvements are undertaken by the tenant, a special lease is frequently obtained. In one case, that of Mr Brown, Upper Dounreay, an extension to twenty-six years was secured, while several others enjoy a tenure of twenty-two and twenty-one years. On some estates, when a tenant contemplates large improvements during the currency of his lease, or especially towards the close of it, he obtains an extension, or, in other words, is granted a new lease of the usual duration. The adoption of leases in this, as in every other county, has been the means of bringing about a great change in the agriculture in every point of view. Besides being instrumental in the reclamation of waste land, in draining, fencing, and building, leases have contributed to the growing demand for large farms. Of course there are other causes that have created this demand, but leases have had their share in this influence. When leases were unknown in Caithness, there were very few large farms; now, as we shall see, there are a considerable number of them in the county.

The number of holdings in Caithness—

Upwards of L.200 rental, is	.	.	.	85
Between L.100 and L.200,	.	.	.	107
Between L.50 and L.100,	.	.	.	171
Between L.20 and L.50,	.	.	.	386
Between L.10 and L.20,	.	.	.	576
And under L.10,	.	.	.	1927
Total,				3252

In many parts of the country a prejudice has long prevailed against large farms. In many cases recent experience has dispelled the prejudice, but in others it has planted the conviction more firmly than ever. Large farms, in ordinary cases, are certainly not to be put down; on the contrary, they deserve to be encouraged. Large farmers are powerful agents in raising a county in the agricultural scale, as well as in many other ways. They spread a healthy enthusiasm around that it is pleasing to



observe. When, however, they are encouraged to the exclusion of middle-class farmers, the question admits of dispute, and not a few are of opinion that there is room for complaint on this matter in Caithness. The writer's opinion is, that the farms in Caithness are not varied enough in size, *i.e.*, that there are too many large and too many small holdings in comparison with the number of middle-sized farms. There is an undoubted want of farms between 200 and 400 acres in extent, or, in other words, too few suited for tenants with a capital of about L.2000. The result of this is, that an agriculturist with capital amounting to about the above sum sometimes ventures on a lease of a farm the rental of which may be from L.400 to L.600, and plods away with loss to himself and dissatisfaction to his landlord. A time there was when a L.2000 purse might have coped with a 700 or 800 acre farm, but times have changed. Such a state of things, obviously, so far operates against the greatest good of the greatest number, in giving something like a monopoly to the moneyed few. It is no unusual thing for one man to hold two or three or perhaps four of the very large farms in the county, paying perhaps in all from L.1000 to L.2000 of rent. There are also too few farms between 80 and 200 acres, *i.e.*, for one or two pair of horses. Of farms properly suited for one or two pairs there are scarcely 300 in the county; while there are over 2800 holdings measuring in extent less than 60 acres, by far the majority being under 20 acres. Very nearly seven-eighths of the total number of holdings are under 60 acres in extent. At the first glance it would be inferred from this that the mistake lies wholly in the percentage of small holdings being too large. But it must be borne in mind that a very large proportion of the crofts in Caithness are held by fishermen as homes for their families, and an eke to their earnings on the sea; and that, therefore, a considerable number of the 2800 crofts must be deducted in calculating the ratio of small to large holdings. How then, it might be asked, are matters to be adjusted? My answer is, not by breaking up those magnificent farms of which Caithness is so justly proud, nor by running together small farms or crofts, but by encouraging the reclamation of waste land, and laying down a rule that the new farms should range in extent from 100 to 200 or 260 acres. There is abundance of scope for this; and I have every confidence that the want which is being felt and recognised will be supplied before many years have come and gone. With a few more middle-sized farms, Caithness would be a model in the way of land apportionment. There can be no doubt that a judicious distribution of large, middle-sized, and small farms and crofts is a most economical feature in the rural development of a county. The large farmers depend on the sons and daughters of the crofters and small farmers for

labour, while the latter trust to the former in getting rid of their young stock.

The five-shift principle has been pretty general in Caithness for a considerable number of years. It began with leases, grew with them, and is now as universal as they are. The first crop is oats; the second, turnips; the third, oats, barley or bere; the fourth and fifth, grass. In some cases the six-shift system is followed, as being better suited to the nature of the soil. Generally speaking, the third year's grass is not very good. Unless the ground be unusually rich, or specially prepared with extra manuring, the sown grasses soon disappear in favour of wild grasses. When permanent pasture is desired, certain kinds of seed are sown; and by a liberal application of top-dressing now and again, a fair cover of foggage is obtained. The most effective kind of top-dressing is a compost of lime and soil. The non-existence of limestone in the greater portion of Caithness tends to reduce the grass-producing qualities of the soil, and if lime were applied more liberally than it has hitherto been, the county would be much improved in a grazing point of view. The benefits derived from judicious liming are perfectly well known and fully recognised by the Caithness farmers, but the difficulty hitherto experienced in obtaining it has prevented many of them from using it so liberally as they otherwise would have done. This drawback, however, will now be remedied by the railway. In one or two cases in the county the four-shift principle is pursued. The farm of Wester Seat, near Wick, occupied by Mr Henderson of Bilbster, is worked in four-shifts, to adapt the farm to the requirements of a large dairy. The land on this farm is good, and when well manured excellent crops are grown.

It has been admitted on all hands that the system of farming in Caithness is fully abreast of the times, the science and practice of agriculture receiving careful study; and while it would be useless to disguise the fact that there is still room for improvement, the landlords and farmers certainly deserve much credit for the gigantic advance they have made during the past twenty-five years. The farm operations, especially on the larger farms, are conducted with method and skill, the use of improved implements being very extensive, while manual labour is carefully economised. The ground for green crop is usually ploughed in the autumn and winter, and is turned over to a depth of 8 or 10 inches, thus allowing the frost to loosen and pulverise the soil. The fields after turnips, and a considerable portion of the lea, are left untouched till the spring. The wet character of the soil in the spring necessitates great care in the cultivating of the clean ground, as, when turned over in a wet state, it is almost impossible to obtain a good tilth, which is so indispensable in procuring a productive crop. The Caithness land is very easy to cultivate,

and a very large breadth is sometimes allotted to a pair of horses. The average of the county is not much short of 80 acres to each pair, and in a good many cases as much as 100 acres is apportioned to a plough. This is considerably above the average of any other county in the north of Scotland. In Aberdeen and Banff, for instance, the average breadth to each pair is not much over 60 acres. The Caithness land is light, level, and easily worked, compared with the soils of these other counties, while the fields are square and generally large, and frost is not severe—important considerations for expediting the tillage. But Caithness has not always been so much noted for economy in labour as it has been of late years. Twenty or thirty years ago it had no room to boast in this way, as may be gathered from the fact that in 1811 the county contained 5157 horses, against a total arable acreage of less than 50,000 acres. Now, the land under rotation extends to 80,423 acres, while the number of horses is only 4969. From the number of acres under rotation, and the number of horses in the county, it might be inferred that the average acreage to each pair of horses is under 80 acres; but it must be borne in mind that about one-fourth of the number of horses given are young animals, not yet trained to work. It is also necessary to mention that crofts or farms under 65 acres are not included in the calculation. In some cases a pair of ponies or little horses are kept on a croft of between 20 and 30 acres, while farms ranging from 40 to 60 acres maintain a pair of horses. The smaller crofters keep a horse each, and two work together, taking the horses in turn—a system that is general over the county, and found to be convenient, though expensive. The cultivation of the crofts, and some of the smaller farms, is not by any means what could be desired, though here, too, the past few years have seen a decided improvement. A few of them have been most zealous improvers of land, having reclaimed and improved more land at their own expense, in comparison with their acreage, than many of the larger farmers, while they cultivate their tidy little holdings with no ordinary skill and care.

The seed time requires the strictest possible attention in this county, the depositing of the seed in a dry, well prepared bed being of the utmost moment. Generally speaking, a good deal of attention is paid to harrowing, and an excellent tilth is usually obtained when the weather is dry. The harrows used are chiefly iron—zig-zag; but on the crofts and small farms, the wooden harrow is still worked. On all farms of considerable size, the grain has been, for a few years, sown by machines, and thus a considerable saving of manual labour effected, while about one-fifth less seed is required. Both the drill and broad-cast sowing machines are used, the latter being the most popular. On the smaller farms and crofts, the grain is generally sown out of a

fustian basket, constructed so as to enable a man to sow with both hands. In some cases the seed is scattered out of a common sheet, one end of which is tied round the body, and the other held by the left hand. There is perhaps no county north of Perth in which the reaper is more exclusively employed in mowing the grain than in Caithness. This county is peculiarly fitted for the operation of that implement, and on almost every farm, however small, one will be found; while on the larger farms as many as three or four may be seen. When the grain is standing upright, so as to allow cutting round the field, it is seldom that more than one reaper is used at a time. In a harvest such as 1874, this mode could be extensively adopted, and the speed is astonishing. As an instance of this, it is worthy of mention that on the farm of Blingery, in the parish of Wick, a hundred acres were cut last harvest in ninety-two hours by one machine. When the crop is heavy, the horses are changed frequently, and when haste is urgent, operations are carried on throughout the whole day, with but brief intervals. So much in favour is the reaper, that in several cases two or three of the larger crofters, who content themselves with the flail to thrash the grain, own a reaping-machine, with which the united crops of the two or three holdings are cut. The scythe is used a good deal among the crofters, while the old-fashioned hook has not yet been wholly laid aside. The system of "leading" the grain is much in accordance with the general principle of the north. It is frequently with no little difficulty that heavy damage from bad weather is escaped, and consequently all possible efforts are made to stack the crop quickly. When not thoroughly dried, so as to admit of being stacked, the grain is put into "screws," or small loosely erected stacks, sometimes on the field, and sometimes in the yard. This system is strongly condemned in many quarters, and except in a bad year, is not pursued to a great extent. The general style of the stacks differs a little from that of most other counties. On the majority of the farms the stacks are built on the "screw" principle, so that the body of the stack is the same as in other counties, but the top is round instead of tapering. This economises time, not only in stacking but also in thatching; and when they are carefully covered, no damage is sustained by watering. The straw-ropes, or "simmins," with which the stacks are netted are plaited twofold with the hand, and form employment to the harvest workers, chiefly the women, in bad weather. The stacks are varied in size, the grain, when thrashed, ranging from five to twelve quarters to the stack. On all the larger farms the thrashing-mills—many of which are driven by steam, others by water, and some by horses—are fitted up with dressing apparatuses, whereby the grain, after being separated

from the straw, is properly prepared for the market. A number of mills are also supplied with elevators; and thus the grain is not only thrashed and dressed, but conveyed to the granary. In other mills a system has been adopted whereby the grain is sacked and weighed, ready for the cart, at one overturn. For the carrying out of this system, the mill must be high enough above the ground to admit of a sack being attached to the spout of the fan. The first sackful is measured by the bushel, and the weight of the grain tested. Then a sack is hung by hooks to the spout of the fan, and, when full, is conveyed by the person in attendance—generally a woman—by a sack-barrow on to the bismar, which stands at hand, with weights equal to the weight of the grain (as tested by the first bag); and being adjusted by adding or withdrawing corn, the bag is wheeled aside; and in this way the operation is continued. By this method those whose mills are driven by water can have their grain thrashed, dressed, weighed, and sacked ready for the cart with the service of four persons—one to feed the mill, one to untie the sheaves, one to clear away the straw from the shakers, and another to attend to the weighing of the grain and setting aside of the sacks. Water mills supplied with elevators sometimes require only three hands, but then the grain is neither sacked nor weighed. These systems of dealing with grain save a great amount of manual labour, besides performing the work more satisfactorily than could otherwise be done, and are therefore worthy the careful consideration of farmers.

The use of artificial manures is extending speedily in Caithness. Twenty-five years ago very little of these valuable commodities were used by the farmers; but of late they have been freely tried. It is becoming more generally known and more readily recognised than ever, that liberal manuring, as a rule, amply repays the outlay; and it may safely be predicted that the importation of artificial manure in Caithness, ten years hence, will show a very large increase. Manure works are to be met with in various districts throughout the north; but, strange to say, Sutherland and Caithness are still without establishments of this kind; while, until a few years ago, when Messrs John Cran & Co. erected works at Bunchrew, near Inverness, and Messrs Munro and Ross at Invergordon, respectively, there was not a single manure establishment north of Morayshire. There is every reason to believe, however, that before many years have passed, Caithness will be able to boast of manure works of its own. Manures of all kinds are obtainable in Caithness almost as cheaply as in any other county in the north. The selection of artificial manures is a matter of the utmost importance to farmers; and in the absence of analytical associations, perfect confidence cannot always be placed in manures imported

from unknown establishments. On this account heavy losses are frequently sustained; losses compared with which a few more shillings per cwt. would be a trifling consideration. Mr Henderson of Bilbster has had a bone-mill on his home farm for some time, and imports whole bones to be crushed by it. A number of farmers in the county have been advocating the establishing of an analytical association, and steps are being taken to carry the movement into effect. There is no doubt that such an association would be productive of much good, and it is to be hoped it will very soon be instituted. During the past few years greatly increased attention has been bestowed on preparing the farm-yard manure. In ancient times the dung was generally allowed to accumulate in a heap, and thus the juice was wrung out and almost entirely lost. Now-a-days the importance of superior farm-yard manure is being fully appreciated, and no little attention is paid to the preserving of its more valuable properties. There are a few covered courts, or at least partially covered, the first one of this description having been erected by Mr Henderson of Bilbster, on Westerseat. Sea-ware is applied in small quantities only on sea-side farms, marl being tried to a slight extent, while fish-offal is used extensively. Mr Henderson of Bilbster, for instance, employs a pair of horses, at one season of the year in driving fish-offal from Wick to his home farm. The value of this material as manure is well known to be high. Shell-sand, which is found in considerable quantities by the sea-side, is substituted for lime by many farmers. It has a fine pulverising effect on the soil, and sometimes produces excellent crops, while it seldom requires repeated application. During a lease of, say nineteen years, the Caithness land requires from fifteen to twenty bolls of lime per acre, according to the character of the soil. That quantity is sometimes divided into two doses, the one being applied five or eight years before the other. When the land is stiff and difficult to operate upon, some give fifteen or twenty bolls to each acre at one time; while others believe in the principle of administering two-thirds of the whole supply at the first dose, giving the remaining third at the second rotation. As already hinted, the improvement in agricultural implements in Caithness has been something marvellous during the past twenty-five years. Up to 1840, perhaps no county in Scotland was further behind in this respect; while at the present day it is doubtful if any county north of Perth can beat it. The most improved modern farm implements of all descriptions are to be found on almost all the large farms, while the smaller holdings are comparatively well supplied. Having already spoken of the almost exclusive use of sowing and reaping machines and iron harrows, I may state that the ploughs now worked are of a very superior kind, and afford a striking contrast

to the ancient "thrapple" plough. The introduction, some years ago, of the double-moulded plough was undoubtedly one of the most important steps of advancement in this department of agriculture. Grubbers of various descriptions, drill-harrows (double and single), and horse-rakes, are very numerous; while all the small implements requisite for a farm are of the best description. Turnip-cutters, potato-pulpers, chaff-cutters, straw-cutters, oil-cake and corn-bruisers, are used on all the principal and on many of the small farms. Carts of the very best make are to be found all over the county.

While much has been done in the introduction of machinery and the lessening of manual labour in Caithness, one grand step of advancement in that direction still remains to be taken. I refer to the cultivation of the soil by steam. The large, square, level fields of Caithness strike one as admirably fitted for steam cultivation, and there seems little doubt that a beginning is all that will be required to make the system general over a great proportion of the county. On a few farms boulder stones and bars of rock would probably interfere with operations, but these obstructions are confined to a small area. The Earl of Caithness, himself a well-known mechanic, has been working steam implements for several years. He invented a steam-carriage, which he steered throughout the county, and which excited the wonder and admiration of every one who saw it. The engine was constructed so that it could be used in pumping quarries and other work. His Lordship reclaimed the whole of Philip's Mains by steam (as shall be afterwards noticed), and is still ploughing and harrowing by steam. It is found to work most satisfactorily, and the noble Earl intends to continue the system. At least one-half of the arable land of Caithness is quite as well adapted for steam cultivation as Philip's Mains; while a visit to the operations going on at Lairg, on the Duke of Sutherland's property, will afford an excellent opportunity of judging of the advantages of steam in the cultivation, and especially in the reclamation of land. The establishing of a Steam Cultivation Society, such as exists in Morayshire, Kincardineshire, and other counties farther south, has been talked of in Caithness; and it need be no matter of surprise though the movement should assume a practical form. As already mentioned, a large number of the thrashing mills are driven by steam; while a good many locomotive steam mills traverse the county, thrashing out grain wherever employed.

Ploughing matches excite no little interest in Caithness during winter and spring. Many of the ploughmen have a peculiar taste for the execution of fine work, and on some occasions very keen competitions take place. It was only the other year that three spirited Caithnessian "dons" of the plough challenged the

Aberdeenshire champions—the Beatons of Fyvie—whose fame has almost become national. The challenge was accepted, and the men duly arrived in the Granite City; but unfortunately the state of the weather prevented the interesting match from taking place. This *craze* for fine ploughing has been the means of introducing the high-cut plough, which turns up a three-cornered furrow. This makes the ploughing “read” much more distinctly, and gratifies the eye; but the file-shaped furrow leaves a much larger vacuum below than the square one cut by a common plough. These vacant spaces are disliked by farmers, as, in fact, is all fine ploughing. I have frequently observed on a field where a ploughing match had been held, that the crop on the prize rigs, especially the first three or four, was neither so heavy nor so equal as on some of the unsuccessful rigs, which were regularly ploughed, though not so highly cut.

Rents are paid half-yearly, generally at Martinmas and Whitsunday. The ancient custom of paying rent in kind has now been numbered among the things that were. It is only some three years, however, since it was abandoned on the estate of Rattar, where one half of the rent was paid in grain up till the death of the late Mr Traill. The average rate of rental per arable acre is about L.1, some paying as little as 15s., while others pay 25s. During the past twenty-five years there has been a rise of from 20 to 30 per cent. of rent per acre.

LAND IMPROVEMENTS.—The difference between the Caithness of the present day and the Caithness of old is extraordinary. I have already referred to great changes for the better in this county, but the cardinal improvements have yet to be noticed. Since 1849 more waste land has been reclaimed in this county than in any other county in Scotland. The zeal for the reclaiming and improving of land has of late been keen and unfagging. These remarks are corroborated by several modern writers, and among others Dr Cleland of Glasgow who says of Caithness:—“It is perhaps the most extraordinary circumstance recorded in the history of political economy, that the remotest and most northern county of Great Britain should, on an accurate comparison between the two last enumerations, surpass all the other eighty-five districts of the kingdom in regard to that great criterion of national prosperity, when it is properly regulated and employed—increased population. It proves what would have been the prosperous state of the other districts in Great Britain had the same zeal for improvement by which this remote county was actuated been extended with equal judgment over the other districts of the kingdom. This increased rate of population is certainly much owing to the establishment of a valuable herring fishery, to the erection of villages for carrying it on, and to the number of persons employed in it. But the improvement of agriculture and



the cultivation of waste lands have gone on progressively with the fisheries; and hence it is, that notwithstanding the great addition to the population of Caithness, there has been no occasion for importing grain from other districts at home, and far less from foreign countries." Twenty-five years ago the extent of land under all kinds of crops was 48,000 acres. In 1811 the arable acreage was 50,000 acres, but that return included a great breadth sown out in permanent grass, or at least not in regular rotation. In 1856 the extent under crop, including bare fallow, was 50,324 acres; in 1857 it rose to 57,591; by 1868 it had reached 77,915; in 1869 it was 78,390; in 1870 it was 79,101; and now (1874) it extends to no less than 80,423 acres. In consequence of the incomplete character of the returns of early days, it is somewhat difficult to ascertain the exact breadth which has been turned from waste land to a state of cultivation in Caithness during the last twenty-five years, but I believe I am not far wrong when I lay it down at 32,000 acres.

In speaking of the reclamation of waste land and other land improvements in detail, I am to assume that the reader is accompanying me on a tour through the county, and that the various improvements shall be pointed out as we go along. Let us begin our journey, then, at the southern end of the county, with the parish of Latheron. This parish is large and irregular, and stretches along the seaside for about 27 miles. It has a large population—about 8500—but in agricultural importance it will not compare with some of the other parishes of the county. Reference has already been made to the estate of Langwell, which is the first property entered upon on passing the Ord Hill from Sutherland, the principal improvements made on it having been executed more than twenty-five years ago. The scenery around Berriedale Castle is perhaps superior to that at any other spot in the county. The braes of the Langwell and Berriedale waters are wooded, and the scene all around is strikingly romantic. As already mentioned, the proprietor of Langwell, the Duke of Portland has converted all this estate, except two sheep hirsels, into a deer-forest. The sheep run of Langwell was a specially good one, and reared a large number of Cheviots. Leaving this romantic spot, which is thus at present partially lost to the agricultural world, we next come to the pretty estate of Dunbeath, belonging to Mrs Sinclair of Freswick. Here the spirit of improvement shows itself prominently. The Mains of Dunbeath is leased by Mr Kennedy, Brandleys, Dumfriesshire, and is partly arable and partly pastoral. It is the largest farm in the parish, and carries a great number of Cheviot sheep. Recently, Mr Kennedy reclaimed from 70 to 80 acres of moorland. The soil is not very good, though, before being cultivated, it grew nothing but stunted heath. The land was limed on the surface at a cost of 1.4 per acre.

The first crop was of very little value, not equal to the cost of seed and labour; the second was a good deal better, yielding fully three quarters per acre. Then came a crop of turnips, liberally manured with farm-yard manure and guano and bones. The turnips were eaten off the ground by sheep, and then the land was sown out with oats, of which there was a fair crop. The whole of the new land has not yet been gone over, but the same course will be pursued all through. It has been only partially drained as yet; but, indeed, draining in this part of the county is scarcely practicable on account of the flat-formation flags that very frequently crop up near the surface. This remark also applies to the old land of this farm, which extends to about 200 acres, and which has been limed and partly subdivided with fences. The liming has greatly improved the fertility of the soil, while the fencing has been found of much value in the consuming of turnips on the fields by sheep. Two or three miles of stone dykes, partly march and partly subdivision, have been erected on the farm within the past ten years, at a cost of from 1s. 6d. to 2s. a yard. Cattle sheds have been erected, capable of accommodating thirty head of cattle. Mr Kennedy, in his efforts to improve his valuable farm, has received cordial assistance from the proprietor. Next we come to Latheronwheel, the property of Major Stocks, a Balaclava veteran, who has made several improvements on his estate, especially on the Mains or home farm. A considerable portion of this estate is taken up with small crofts. With the exception of a few farms, the whole of the arable land along the coast in this parish, for nearly a mile in breadth, is held by crofters, who are all, less or more, connected with the sea. These crofts are held by the fishermen as a home for themselves and their families. They vary in size from 2 to 20 acres, and the bulk of the crofters keep each a horse, a cow, and a few sheep, having generally a calf for sale to assist in paying the rent. Fishers have never been noted as careful agriculturists, and the land they hold here is by no means so well cultivated as it ought to be. A few of the crofts are neat and regular enough, but by far the greater number are very imperfectly laboured. There is no doubt that among this class of agriculturists in Caithness a considerable change for the better has taken place during the past twenty or thirty years, as well as among the farmers, yet improvement in the croft cultivation is still required. Though these Caithness maritime crofters are, as a rule, comfortable enough in a pecuniary view, many of their dwelling-houses are miserable hovels. Leaving Latheronwheel, the next important farm we come to is Mrs Gunn's home farm of Latheron. On the estate of Latheron the late Mr Gunn made valuable improvements at great expense. The home farm contains about 200 acres arable, and is neatly and regularly laid off. Next comes Mr

Sutherland's estate of Forse, where a considerable portion of land has been reclaimed, and other valuable improvements of various kinds executed of late years, including a number of superior farm-steadings and homes for farmers and crofters. As the soil here is not very heavy, and close upon the rock, draining is a matter of extreme difficulty. Mr Gordon's neat little estate of Swiney, which, too, has been greatly improved of late, lies a few miles further on. The holdings here are chiefly small, many not exceeding ten acres in extent. Passing the thriving village of Lybster, we come upon the large, finely laid out, carefully managed farm of Clyth, occupied by Mr Douglas. This farm is on the property of the same name belonging to Mr Sharp of Rothes, who a few years ago purchased the estate. By far the greater portion of the farm of Clyth was reclaimed from moor and unproductive wastes upwards of thirty years ago, by the late Mr Horne of Langwell. The land was thoroughly drained, and the fields laid off with dyke fences. Since then improvements of various kinds have been made, and now the farm, about 300 acres arable, is as neat and regular as could be wished. The farm-houses are commodious and substantial, while the dwelling-house is an excellent one. Mr Douglas is a careful, experienced farmer, and produces very superior crops of oats, barley, and turnips. The coast of Caithness is generally steep and very rugged. Here it is unusually rugged, and when the wind blows from the German Ocean the rolling waves strike against the rocks with terrific fury, dashing the salt spray some hundreds of yards over the land. The salt, in excess, is very poisonous to young crops, and considerable damage is in this way sustained along the coast. The other holdings on the estate of Clyth are principally small, but on some of them a good deal of improvement has been done. The rental of the estate has greatly increased during the past twenty-five years, the present rental being L.3531. Besides the farm of Clyth, Mr Douglas leases a very large sheep run on the estate of Camster, belonging to Mr Strong. It lies some four miles inland from Clyth, and is stocked with Cheviot ewes. Mr Douglas pursues that course so prevalent in Caithness, of rearing half-bred lambs—a cross between a Cheviot ewe and Leicester tup—which he “hoggs” on his arable farm, selling them off in the spring or early summer. In the interior of the parish of Latheron, and along the side of the Sutherland hills, there are several very large sheep runs, extending to many thousands of acres. On these considerable improvement has been effected by surface draining.

Proceeding along the county road from Clyth, and passing a number of small holdings, we enter the parish of Wick, which can boast of a number of large fine farms. A short distance past Harril Head lies the compact little estate of Ulbster, which from

time immemorial has been in the hands of the Sinclairs. The present proprietor is Sir J. G. Tollemache Sinclair, M.P. for the county, whose indefatigable efforts for the good of Caithness will be afterwards referred to. Leaving Ulbster, we pass a number of crofts and small farms, on which a good many acres have been reclaimed and improved since 1849. The land here is very much broken with rock, and on many places it is utterly impossible to run a plough. The rock or flagstone is quite close to the surface, which is very rough and irregular. The soil is sharp and fertile, but not by any means plentiful, even on the finer spots. The character of the surface here has operated strongly against improved cultivation. Passing the little rural village of Borrowston, we next reach the estate of Thrumster, the property of Mr Bentley Innes. Thrumster House stands on our left, partially shrouded amid a close clump of trees. During the past twenty-five years the arable area on this estate has been extended a little, while the rent has been greatly increased. The holdings on this estate are so very numerous and small that it would be needless to particularise the improvements recently done. So numerous are the crofts, that, for the sake of distinction, Mr Bentley Innes found it necessary to have the houses numbered in street-like fashion. These small crofters are less or more connected with the sea, and when no fishing is to be had, they obtain agricultural employment throughout the county. Some of them keep two or three cows, and the produce of the dairy, united with other revenues, enables them to live a happy, comfortable, and contented life. Their social condition has greatly improved since the beginning of the present century.

Taking the county road again, a walk of some two miles brings us to Hempriggs, the estate of Sir George Dunbar, Bart. Hempriggs House lies on our right, and is seen towering above its thickly wooded policies. Sir George resides at Ackergill Tower, about a mile and a half north of Wick; and his principal improvements having been executed there, they shall be noticed when we come to it. Between Hempriggs and Wick there are a few middle-size farms, but the arable land here is about the oldest in the county.

Before crossing the Wick river we shall exhaust what is to be seen in the parish on this side. The Stirkoke property lies some four miles up the river, and is the first we come to on our new course westward. The early improvements and other facts connected with this estate have already been referred to, and therefore less now remains to be said. Stirkoke House, which is beautifully situated in finely wooded policies, is one of the most charming residences in the county. At the present time it wears a mournful gloom, its intelligent, kind-hearted, much-respected owner, Major Horne, having been gathered to his

fathers on the 21st Oct. 1874. Major Horne retired from the army in 1854, after twelve years' service, and since then he resided for the most part in Caithness, taking an active part in public business. He was a deputy lieutenant of the county and a justice of peace, besides holding seats at other county boards. He was a Conservative in politics, and contested the county with Mr Traill of Rattar at the general election in 1868, but was defeated by 512 to 275 votes. He was a liberal landlord, and spared neither pains nor expense in improving his estate. Taking several of the best farms on Stirkoke estate into his own hands, by reclaiming, draining, and fencing, he soon set models of neat and orderly farms to the country. He kept Cheviot ewes and reared half-bred hoggs, his flock being one of the best in the county. He also kept a good many cattle of superior quality. In some cases the crofters on this estate, encouraged and assisted by the proprietor, have more than doubled their arable area since 1849.

Leaving Stirkoke, and turning a little to the left, we reach the farm of Blingery, occupied by Mr Gill. This farm is on the Stirkoke estate, and was greatly enlarged and improved by Major Horne, who held it in his own hands for some years previous to 1858, when Mr Gill leased it for twenty-one years. The arable area at that time was little over 200 acres, and is now 300 acres. The land reclaimed was of a moory character—a mixture of clay, moss, light loam, and shingle. First the waste land was pretty closely drained with tiles, and then ploughed mostly with the common plough, a small portion of it being ploughed with an implement specially prepared for turning over a strong furrow and drawn by four horses. In the reclaiming of a few acres Mr Gill tried the turning over, first, of a usual sized furrow with the common plough, a smaller one from the subsoil being thrown on the top. This secured a good tilth, and facilitated the decomposing of the vegetable surface lying below. The new land has all been under one course of cropping, and the experience has been satisfactory. The grain crops averaged fully three quarters per acre. Besides the reclaiming of this land, Mr Gill has redrained the softer portions of the old land, erected a considerable stretch of dykes and other fences, constructed roads, and made various other improvements. The farm is very neatly laid out, and is cultivated with skill and care. A number of years previous to Mr Gill's entry, an excellent steading was erected on the farm, at the expense of the proprietor, the tenant who then occupied it driving the material. A grieve's house and bothy were also erected. Since Mr Gill entered the farm, a large and very handsome dwelling-house has been erected, the proprietor bearing the outlay and Mr Gill performing the cartage. In connection with Blingery, Mr Gill holds a very large sheep run, extending to several thousands

of acres, part of which he has improved by surface draining. He keeps Cheviot ewes and Leicester tups, hogging on his arable farm. He used to keep a small number of blackfaced sheep, but the last remnant of the flock was disposed of in September last.

We come next to notice the large and valuable farm of Thuster, situate between Blingery and Wick river, and occupied by Mr Miller, a skilful and most systematic farmer. This fine farm as it now stands includes, besides the original Thuster, the farms of Upper and Lower Wathegar, and about 100 acres of the home farm of Stirkoke—the entire extent being 730 acres arable. The two Wathegars lie on the west side of Thuster, and were joined to it when Mr Miller obtained his lease in 1871. The greater portion of Thuster proper was reclaimed by the proprietor previous to 1849, but since then a considerable breadth has been added. In 1858 the farm was let on lease to a Mr Watson, who held it only for a few years. Mr Watson drained the whole of the arable land, except one field (which Mr Miller has since drained), and made extensive improvements in various ways, laying out a large sum of money. During Mr Watson's tenure, the proprietor built an excellent dwelling-house and additional office houses, the tenant driving materials. On Mr Watson's departure, the farm fell into the hands of the proprietor till it was leased by Mr Miller. In 1858, the year in which Mr Watson entered Thuster, Upper Wathegar was leased by Mr Wright, and Lower Wathegar by Mr Mollison (now factor to Mr Baillie of Dochfour). Mr Mollison drained and reclaimed the greater portion of his arable land. He also erected suitable houses and executed other improvements. Mr Mollison left the farm some eight or ten years ago, when it fell into Major Horne's own hands. Mr Wright, who drained and reclaimed a number of acres, held his farm only for a few years, and was followed by Mr Duguid, who also left in a few years, after adding to its arable extent. This farm also fell into the proprietor's hands. The question may be asked, Did these improvements pay? What the loss was, I am unable to say; but the facts related tend to show that the improvements were of an unremunerative kind. The two Wathegars are now sown out as sheep runs, and the houses, with the exception of two or three small buildings, have been removed. Besides the grazing of these two farms, Mr Miller has 134 acres of meadows on the banks of the Wick river, about 100 acres of old arable land on Thuster, and upwards of 700 acres of hill pasture, which, taken altogether, make a valuable sheep run. Mr Miller follows the customary system of rearing half-bred hoggs, and eats the most of his turnips off the land by the sheep. He also breeds pure Leicesters, but of this more anon. In addition to this extensive holding, Mr Miller leases the large

arable farm of Lower Dounreay and the sheep farm of Brubster, both in the parish of Reay. On these he has made extensive improvements, which we shall notice when we reach that corner of the county. Continuing our course along the river side, we next reach the valuable little estate of Bilbster, which has been the scene of very extensive improvements. It was formerly owned by a family named M'Leay, who drained, squared, and fenced the fields with hedging, the work being superintended by the late Mr Purves. The whole estate was scarcely gone over when it was purchased by Mr Henderson, the present proprietor, about twenty-five years ago. At that time the home farm measured only 170 acres arable, but Mr Henderson, who has been a most zealous improver, has since extended it to upwards of 1000 acres. A considerable portion of the waste land was dotted over with small crofts. The greater portion of the new land was reclaimed from moor and moss, about 600 acres being of the latter. The reclaiming of this portion of moss was perhaps the most gigantic part of all Mr Henderson's improvements, and they have been extensive. The moss varied from 1 to 15 feet in depth, and was covered with stunted heath and moss foggage. The land was first of all drained with tiles, the distance between the drains being about 30 feet. It was ploughed lightly with a common plough, the furrow being light. Before cropping, a liberal supply of fish-offal mixed with soil was spread on the land, and then oats were sown. The first crop was not very heavy, but quite as good as could have been expected. In autumn it was ploughed with a heavier furrow than at the first overturn, and in spring it was again sown with oats, the crop being considerably better than the first one. On the removal of the grain, the land was ploughed with Howard's plough at a depth from 8 to 12 inches. In spring it was scarified with Howard's grubber, limed with from 20 to 30 bolls per acre, manured with home-ground bones, and sown with yellow turnips. The crop was an average one on the greater portion of the ground, but on a few spots the turnips never braided properly. The turnips were eaten off by sheep, and then in spring the land was put under oats and sown out in grass. The oat crop was an excellent one and yielded well, while the grass also grew well. Besides continuing his predecessor's work in fencing and draining the old land, Mr Henderson enclosed and subdivided the whole of the new land with hedges, dykes, flags, and wire, and made several miles of service roads. It is very difficult to give any correct indication of the cost per acre of these improvements, but Mr Henderson's outlay from first to last in the way of reclaiming and improving land was very little under L.12,000. The value of his estate in some twenty years was increased nearly fourfold. Mr Henderson also augmented the farm steading, making it in

every way a superior one, the cattle sheds being large and covered. A portion of the estate is let to six tenants, who pay from L.40 to L.70 of rent. On these places a considerable breadth has been reclaimed since Mr Henderson became proprietor. Attached to the Bilbster estate, Mr Henderson holds a large sheep run, 300 acres of which he has converted from impassable bogs to excellent pasturage by surface draining. The drains were cut from 15 to 22 feet apart and about 18 inches deep. It is worthy of mention that these improvements have been executed under the superintendence of Mr Morris, who has acted as farm manager to Mr Henderson for upwards of twenty years. Mr Henderson also leases the farms of Westerseat and Toftcarle, on the estate of Sir George Dunbar. Toftcarle contains about 200 acres arable, all of which, with trifling exceptions, has been reclaimed by Mr Henderson since he entered the farm thirty years ago. The whole of the land was drained, regularly laid out, and fenced. The whole of Westerseat, nearly 600 acres arable, has been under cultivation for about thirty years; but with the exception of 105 acres it was all reclaimed by Mr Henderson. The land was in a very poor state when leased by him, which will be readily inferred from the fact that his predecessor's last grain crop comprised only eight small "screws" or stacks. This farm is managed by Mr James Morris, son of Mr Henderson's manager at Bilbster, and is worked on the four-shift principle—a principle greatly facilitated by its proximity to Wick, where extra manure is easily obtainable. The soil here is partly light loam mixed with moss, the subsoil being shingly and in some places rocky. Excellent crops of grain and turnips are grown. Mr Henderson keeps twenty-five cows for dairy purposes on this farm, which yield a handsome revenue. Besides additions to the steading and the erection twenty-five years ago of covered cattle courts—the first of the kind in the county—considerable portions of the softer fields were drained. In concluding our account of Mr Henderson's vast improvements, we may state that since 1835 he has converted upwards of 2000 acres of waste land into productive soil.

The farm of Sibster, about four miles from Wick, next falls to be noticed. It forms an estate by itself, and was at one time held by the Hornes, who improved it greatly. It then became the property of Mr Rhind, and after the death of the late owner it was recently purchased by Sir George Dunbar. Mr Rhind, son of the original purchaser, reclaimed a great breadth, at much expense. The present tenant, Mr Gunn, has held one lease of it, and has redrained and fenced a great portion of it. Mr Gunn also leases the arable farm of Greenland, on the estate of Rattar, which was drained, reclaimed, squared, and fenced by the proprietor more than twenty-five years ago; as also the extensive



sheep farm of Glendhu in Sutherlandshire. He winters his Sutherlandshire hogs on his Caithness farms, sending them back to the hills of Glendhu in March or April; and he takes down his cast ewes, rearing a crop of half-bred lambs, for which he usually obtains the top prices of the county. Leaving Sibster, we pass to the improvements made by Sir George Dunbar on the estate of Hempriggs. Sir George, who has been a spirited improver, obtained possession of the estate about thirty years ago, and since that time upwards of 4000 acres have been added to the arable area of the property—partly by himself and partly by his tenants. What he has himself reclaimed has been lined off in 30 acre parks, fenced with dykes, flags, and hedges, and intersected with excellent service roads. The soil here is chiefly light loam, with a mixture of moss and gravel. Sir George has three farms in his own hands just now, and keeps a herd of shorthorn cattle and a hirsle of Leicester sheep, which will be noticed in their proper places. On the large arable farm of Noss, occupied by Mr Scott, good improvements have been effected in the way of fencing and draining.

Instead of following the sea-coast farther, we shall now proceed through the centre of the county, passing in review the parishes of Watten, Halkirk, Reay, Thurso, Olrick, Bower, Dunnet, and Cannisbay. In an agricultural point of view, Watten is one of the most important parishes in the county, being largely cultivated with extensive and complete farms. The farm of Watten is situated on the estate of the same name, which was bought more than one hundred years ago by Sir Robert Anstruther (great grandfather of the present proprietor, Sir Robert Anstruther, M.P. for Fifeshire), and was by him extended by 400 acres. This he drained and divided into fields, fencing them with hedges and dykes. He also built a commodious and most substantial steading, which, though nearly a hundred years old, is still standing as firm and strong as ever. Watten remained in the proprietor's hands till 1836, when it was leased by Mr Brown, the present occupant. During the earlier part of his first lease, Mr Brown reclaimed 200 acres of waste land which completed his bounds. Since then he has worked on the six-shift rotation, has drained the whole farm, largely extended the steading, and is just now erecting byres. The soil on the farm of Watten is perhaps the best in the county, and produces excellent crops of all kinds—the average return of grain being about five quarters per acre, or fully a quarter above the county average yield per acre. Mr Brown manures liberally with artificial stuffs, and has done so for nearly twenty-five years. He has kept a stock of pure Leicesters for thirty-six years. The rent of the farm has been tripled since Mr Brown entered on it, while the rental of the whole of Sir Robert's estate here has been nearly

doubled during the last twenty-five years. A little farther on lies the small estate of Lynegar, the property of Mr Adam, banker, Wick. It was purchased from the Hornes some twenty years ago, by the father of the present proprietor, for L.11,000. The whole extent is about 1128 acres, of which little more than 200 acres were under cultivation when Mr Adam obtained possession of it. The farm was at that time in very bad order, and the first work of the new proprietor was to drain, square, and trench-plough the old land. This done, he immediately commenced the reclaiming process, and now the arable area extends to close on 700 acres, 463 acres having been added to the arable portion since 1853. The reclaimed portion was covered with heath and insipid vegetation, and thus almost valueless as pasture. The 463 acres were divided into seventeen fields, varying from 17 to 60 acres, and were completely fenced with dykes, flags, and hedges. The old land, though producing miserable crops at first, is now, as the result of sustained costly treatment, the most productive on the farm. The late Mr Adam died a few years ago, and his efforts have been continued by his son, a gentleman of enterprise and intelligence. Besides these improvements, which have fully doubled the value of the estate, Mr Adam built servants' cottages and a bothy, and made additions to the farm-steading. The farm is worked with seven pairs of horses. There are still about 300 acres on the estate suitable for cultivation, and the greater portion of this has been limed off for reclamation.

On the south side of the Loch of Watten lies the extensive farm of Wester Watten, occupied by Mr Paterson. The reclaiming and laying out of this farm, extending to 1000 acres arable, have already been noticed. Of late years, however, improvement has been effected in the way of re-draining and building. Next comes the farm of Oldhall, extending to 2000 acres, one half of which is under cultivation, the other half forming a sheep run. This farm is occupied Mr John Davidson, whose uncle (the late Mr H. Davidson) was a most energetic farmer, having reclaimed many hundred acres of waste land. He drained and reclaimed over 600 acres on Oldhall, laying it out in fields varying from 15 to 20 acres, and fencing it with dykes and hedging—thorn chiefly. He also drained the old arable land, surface drained the sheep run, and fenced it with dykes and thorn hedges. The hill land would be easily reclaimed, and would be quite as suitable for cultivation as the portion already reclaimed. A considerable portion of what has been reclaimed was pared on the surface for top-dressing in ancient times, and before it could be made to produce crops satisfactorily had to be trench-ploughed and liberally manured with a mixture of lime and marl. These portions before being reclaimed were

utterly useless, but now are very fair land, and pay farming well. Mr Davidson erected excellent houses on this farm, the proprietor paying half of the expense; while he also constructed about five miles of service roads and about thirty miles of thorn hedges, all at his own expense. This farm is worked by nine pairs of horses. Mr Davidson also holds the farms of Braemore, Strupster, Trestelle, and Buckies. The former is wholly hill pasture, and is under sheep. It was all surface drained and enclosed with wire by the late Mr Davidson. The improvement effected by the draining is amply illustrated by the fact that it now maintains double the number of sheep it was capable of keeping when Mr Davidson leased it—about 2000. Trestelle is on the Earl of Caithness's estate, and was all under sheep when leased by Mr Davidson, who reclaimed close on 250 acres, a considerable portion of it from deep moss. It was thoroughly drained, has been well farmed for some years, and now produces good crops of bere, oats, and turnips. The land was divided into regular fields, and fenced with flags and whin hedges. The sheep run here was also surface drained. A thousand sheep and between thirty and forty cattle are maintained on this farm, worked by three pairs of horses. A steading was also erected. The farm of Buckies is on the estate of Ulbster, the property of Sir J. G. Tollemache Sinclair, M.P., and comprises 1000 acres, 500 being arable. Mr Davidson reclaimed about 400 acres here, draining and fencing it with dykes, flags, and hedges, besides draining the old land and erecting excellent office houses. On the farm of Strupster, the property of Mrs Sinclair of Freswick, he improved upwards of 60 acres of land, and surface drained for sheep about 4000 acres. The present Mr Davidson now farms upwards of 1750 acres of arable land, of which about 1250 were reclaimed by his late uncle. The whole estate of Scouthall was improved many years ago by the late Mr William Horne. The estate of Toftinghall, belonging to Sir Patrick Murray-Thriepland of Fingask, has been improved extensively of late years, and the rent considerably raised. It extends to 10,942 acres, the rental being L.2077.

The farm of Wester Dun, occupied by Mr D. Henderson, also lies on the south side of the loch of Watten. Previous to 1853, when leased by Mr Henderson, this farm was held by the proprietor himself—Sir R. Anstruther—for about twelve years, and under the superintendence of Mr Henderson of Bilbster (then factor on Sir Robert's estate), was greatly enlarged, drained, and squared off. In consequence of being subject to mildew, attributed to the damp nature of the land and its proximity to the loch of Watten, the land was sown out into a sheep run, and so remained a few years, until leased by Mr Henderson. The land was recultivated and thoroughly drained, and now there is little

room for complaint with respect to mildew. Mr Henderson fenced the whole farm, about 350 acres, of which 70 are still uncultivated. He has also made additions to the farmsteadings.

Leaving Dun, and passing a number of small places known as "Labour-in-vain," we observe the mansion-house of Stempster, charmingly situated on a moderate eminence on the opposite or north side of the valley. The estate of Stempster lies in the parish of Bower, but it is so close upon our present course that it will suit best to notice it here. Mr Henderson is convener of the county, takes a lively interest in everything connected with its welfare, and is a gentleman of more than ordinary intelligence, energy, and kind disposition. The late Captain Henderson, father of the present proprietor, immensely improved this estate, upwards of forty years ago, by reclaiming a large portion, and draining and fencing almost the whole of it. In 1830 he obtained possession of the estate of Brabster Dorran, in the neighbourhood. He reclaimed, drained, and fenced the Mains, keeping it in his own hands, while he drained and fenced the whole of the other portion of the estate, increasing its arable area, and divided it into farms, one of which draws a rent of L.180, the others being smaller. Captain Henderson also leased the whole of the estate of Murkle, belonging to Sir R. C. Sinclair, for nineteen years previous to 1859. The present Mr Henderson still retains the Mains of Murkle and the Mains of Brabster Dorran, while he also farms the Mains of Stempster. He has altogether 23 pairs of horses—10½ on Stempster, 6½ on Brabster Dorran, and 6 on Murkle Mains. The total arable acreage of the three farms is 1590, and the pasture land 345 acres. Mr Henderson has considerably improved the land by draining, fencing, and building, and more regular or more systematically worked farms could hardly be wished for. The whole of the Stempster estate, save the Mains, is let out in small farms. On these the tenants, encouraged and assisted by their proprietor, have increased the arable area, and improved the old land by draining and fencing. Mr Henderson keeps a mixed stock of cattle and sheep on his farms, and obtains the top prices for both. Last year he had upwards of 280 acres under turnips. In the immediate neighbourhood of Stempster lies the large farm of Tister, tenanted by Mr Waters, who holds other three farms in the county, and who has been an extensive improver of land as well as a successful farmer.

Continuing our course westwards, we enter the parish of Hal-kirk at Banniskirk. This small estate belongs to Mr Williamson, and extends to 1375 acres, mostly under cultivation, the rental being L.697. Reclaiming, draining, and fencing have been going on on this estate lately. Mr Paterson, tenant of Wester Watten,

leases this estate, the land of which, like most of the parish of Halkirk, is rather wet and difficult to dry. The extent of the parish of Halkirk is 73,000 acres, of which little more than one-tenth is under cultivation, by far the greater being moor and flow-moss. The land around the village, standing on a level plain at the north-east end of the parish, is all cultivated, and the holdings are small. Extensive improvements were executed on the farms of Hoy, Strathmore, Tollechen, and Wester Dale, by Mr Clyne, Reister; but for convenience these shall be noticed afterwards. The estate of Scots Calder, owned by Colonel Guthrie, has been immensely improved during the past twenty-five years. When he acquired the estate, about thirty years ago, the whole rental was scarcely L.1000. Now it is L.2657—increase, L.1657. The rental of one farm on the estate is nearly equal to the whole annual value of the property thirty years ago. Lately the colonel expended more than L.4000 on land improvements and building, while his tenants have liberally supplemented his expenditure. There is still much to do on this estate, however, there being about 6000 acres of moor and flow-moss of comparatively little present value. This Colonel Guthrie is determined to turn to better account than the producing of wild grass. He has offered two premiums—one of L.30 and another of L.20—for essays on the best mode of utilising this waste land, the turning of it into sheep runs or arable farms, or part of both. A number of experienced gentlemen have been inspecting the ground, and there is little doubt that the premiums will be keenly contested for, while the gallant colonel's laudable object will doubtlessly be attained.

There are a number of excellent sheep farms in this parish, particularly about the southern end. Almost all of these have been greatly improved of late by surface draining and fencing; but there is still room for more of these improvements.

The Crown holds 9167 acres of land in the county, including the small estate of Dorrery, at the north end of this parish. This estate is wholly under pasture, and was leased as a sheep run in 1860 by Mr James Purves, Lochend, for nineteen years. Mr Purves improved the pasture very much by enlarging the outlet of Loch Shurery, which lies along the west side of the lands of Dorrery, and which used to overflow its banks in high floods, and cover the Torrans Leens, rendering them next to useless as pasture ground. The grass on the Leens was so sweet that it was almost impossible to keep the sheep away from it even when half flooded with water. This had a most serious effect on the flock. Rot spread rapidly, and in two years Mr Purves lost L.800 value of sheep from this cause. The enlarging of the loch's outlet, changing and widening part of the channel of the water of Torran, and other items of work in connection with the undertaking, cost the

tenant in all L.371, 17s. But the object of the scheme was fully accomplished. The Leens now grow excellent crops of meadow-grass, affording valuable pasture. Rushes and sedges formerly grew in great abundance, but have now been partly superseded by rich grasses. A report on the undertaking by Mr Purves will be seen in the Transactions of the Highland and Agricultural Society for 1869.

Leaving Halkirk, we next visit the parish of Reay, a portion of which stretches into the county of Sutherland. The surface is irregular, and the extent under cultivation is small, but yet it contains a few as fine farms as any in the county. The most westerly estate in the parish is Sandside, owned by the Duke of Portland. He holds the whole of it in his own hands, and labours the home farm of 200 acres arable. The soil here is very light and sandy in some parts. So near to the hills the grain crops grow well, and are ripe a few days earlier than on most other farms in the parish. The next estate we come to is one that has been the scene of very extensive improvements during the past twenty-five years—Dounreay, belonging to Sir R. C. Sinclair, Bart. of Murkle and Stevenson. The improvements on this and on the Murkle estate were reported upon by Mr Reid Tait, C.E., the able factor to Sir Robert, in the Highland and Agricultural Society's Transactions for 1866. The estate of Dounreay measures 16,464 acres, and Murkle 2216 acres. The leases on both estates expired in 1859, and three years previous to that, the proprietor, Admiral Sir John Gordon-Sinclair (who died in 1863), being desirous of improving his land, obtained Mr John Mitchell, banker, Dingwall, to report upon the re-letting and improving of the estates. Mr Mitchell recommended the abolition of the sub-letting system, and the expenditure of L.14,200 upon buildings, fences, and roads; at the same time submitting the following estimate, indicating a clear gain to the proprietor of L.1127, 12s.

	Present Rents.	Outlays.	Interest on Outlays at 6½ per cent.	Future Rents.
Estate of Murkle,	L.832 4 0	L.5,000	L.325	L.1,510
„ Dounreay,	1,355 4 0	9,200	598	2,978
	L.2,187 8 0	L.14,200	L.923	L.4,488

Rent for next lease, as above, . . .	...	L.4,488 0 0
Present Rent, . . . . .	L.2,187 8 0	
Interest on Outlays and Incidents, . . .	1,173 0 0	
Taken from the proposed Rent, . . .	<u>          </u>	3,360 8 0
Leaves a clear gain of, . . . . .		<u>L.1,127 12 0</u>

The proprietor highly approved of Mr Mitchell's report, and employed Mr Tait, the present factor, a gentleman of experience in land management, to carry out the recommendations. The farms were all let on nineteen years' leases, the agreement bearing among other things that "drainage money will be provided for such tenants as may not wish to drain at their own expense, on which money they are to pay the drainage rent charge along with and under the same conditions as the rent. All lands capable of being brought into profitable cultivation are to be improved by the tenant within the first seven years of the leases." The large farms were advertised, and brought rents exceeding the valuation, the small holdings being let exactly at valuation. The rules as to reclaiming of waste land were stringently adhered to by the tenants, and in seven years upwards of 2000 acres were brought under cultivation, Mr Reid Tait superintending the operations. During the first seven years of the leases 500 miles of drains were cut by the proprietor, 15 new farm-steading and 4 dwelling-houses erected, 22 miles of dyke fences and 19 miles of clay fences constructed, and 8 miles of service roads made. As showing the proprietor's outlay on the improvements, I take the following statement from Mr Tait's report:—

*Buildings.*

Estate of Dounreay,	.	.	L.6,620	11	6½	
Estate of Murkle,	.	.	2,968	8	11	
Miscellaneous,	.	.	61	8	5½	
						L.9,650 8 11

*Drainage.*

Estate of Dounreay,	.	.	L.3,741	9	5½	
Estate of Murkle,	.	.	2,771	3	4	
Tiles for Dounreay and Murkle,	.	.	2,672	19	5½	
						9,185 12 3¼

*Ring Fences.*

Estate of Dounreay,	.	.	L.784	3	1	
Estate of Murkle,	.	.	323	5	5	
						1,107 9 4

*Interior Fences.*

Estate of Dounreay,	.	.	L.414	7	9	
Estate of Murkle,	.	.	486	16	10½	
						901 4 7½

*Farm March Fences.*

Estate of Dounreay,	.	.	L.396	8	9	
Estate of Murkle,	.	.	46	0	7	
						442 9 4

*Property March Fences.*

Estate of Dounreay,	.	.	.	.	.	399 17 3
Carry forward,						L.21,687 1 8½

	Brought forward,	L.21,687	1	8½
<i>Service Roads.</i>				
Estate of Dounreay, . . . .	L.308	13	0½	
Estate of Murkle, . . . .	177	12	10½	
				486 5 11
<i>Farm Roads.</i>				
Estate of Dounreay, . . . .				238 17 2½
<i>Miscellaneous.</i>				
Estates of Dounreay and Murkle,}				58 3 11
<i>Flag Quarries.</i>				
Dounreay Quarries, . . . .	L.2,431	2	7½	
Murkle Quarries, . . . .	727	7	11½	
Pavement Manufactory, . . . .	903	11	11½	
				4,062 2 6½
Total amount expended from Whitsunday 1859 to Martinmas 1864, . . . .		L.26,532	11	3¾

Mr Tait further says:—"From the sum of L.26,532, 11s. 3¾d. has to be taken the amount received for pavement, &c., and the value of the pavement in stock, amounting in all to L.2403, 14s. 9½d., which leaves, as the true amount expended, L.24,128, 16s. 6½d. The tenants pay an annual drainage rent charge of L.400, 17s. at 6½ per cent., and L.236, 17s. at 5 per cent. These sums capitalised amount to L.10,904, 17s. 3½d., which taken from L.24,128, 16s. 6½d., leaves L.13,223, 19s. 2¾d. as the amount expended by the proprietor upon improvements not yielding interest. The item L.399, 17s. 3d., under the head 'Property March Fences,' was not included in the estimate of L.14,200, and therefore falls to be taken from L.13,223, 19s. 2¾d., leaving L.12,824, 1s. 11¾d., which taken from L.14,200, shows a balance of L.1375, 18s. 0½d. in favour of the improvements." The leases expire in 1878, and I understand that the proprietor contemplates arranging with the tenants about this time for new leases. It is expected that by 1878 the arable area will be increased by at least 2500 acres, which at 15s. per acre, would produce a rental of L.1875. This added to the present rental, L.5084, including interest payable by the tenants, gives L.6959, which is the contemplated rental for next letting. By the end of the present leases, the debt upon the estates for improvements will be reduced to L.14,000. The interest which the tenants pay to the proprietor during their leases will pay off about L.10,000 of capital and interest.

But we must look more closely at these improvements. The most westerly farm on the Dounreay estate is Isauld, occupied by Mr Bain, who reclaimed a considerable portion during the first seven years of his lease, and who has improved about 30 acres



within the last four or five years. He drained the whole farm, fenced the greater part of it with flags and dykes, and is just now in process of fencing the remainder. Next comes the large valuable farm of Lower Dounreay, occupied, as already stated, by Mr Miller, the tenant of Thuster. When Mr Miller leased it in 1859, the arable area extended to 450 acres, and since then he has added 200 acres. The soil was cut away from a good deal of these 200 acres for top-dressing purposes many years ago, and though very kindly treated is still light land. It would scarcely pay regular cultivation, but will make good sheep pasture, which in fact was the chief object in reclaiming it. A part, however, of the new land produces good crops. Besides draining and fencing these 200 acres, Mr Miller drained a considerable portion of the old land, squared up the fields, and fenced them with dykes and flags, thus adding between 30 and 40 acres of what had hitherto been lost in curves and corners. The soil here is of a loamy nature, very close upon the rock, and not very heavy. Mr Miller is a liberal manurer, and a very careful farmer. Dounreay lies along the Pentland Firth, which strikes against a very rugged coast here with terrific fury, dashing the spray over a great breadth of land, and frequently thereby damaging the crops. Since Mr Miller entered the farm, a very handsome dwelling-house, four cottages for servants, and mill and stable, have been erected, besides other additions to houses on the farm. On Brubster, lying a few miles inland from Dounreay, Mr Miller keeps a very superior stock of pure Cheviots, feeding his hogs on Dounreay, and selling them at the Georgemas Market, where he usually obtains the top prices. He also sells a number of his ewe hogs to sheep farmers in the county for breeding purposes.

Adjoining Dounreay is Mr Brown's farm of Upper Dounreay, which up to 1859 was wholly under heath, with the exception of a few small cultivated spots. In that year Mr Brown obtained a twenty-six years' lease of it from Admiral Sir John Sinclair, and immediately set to the reclaiming. He lined off the land in square fields, drained it thoroughly, and then ploughed it, taking two crops of oats in succession, and manuring the land well. Then followed a crop of turnips grown with artificial manures, and then oats, the land being sown out into grass. The oats grew fairly, while the turnips turned out exceedingly well. In 1863 Mr Brown won the cup competed for annually by farmers in all parts of the county with turnips (yellow) grown on a field that only three years previous to that was clad with heath. The prescribed extent for competition was ten acres, and the weight of Mr Brown's turnips was 25 tons 12 cwts. 3 qrs. 11 lbs. per acre, or  $2\frac{1}{2}$  tons above the next highest in the competition. In 1865 Mr Brown competed with another field; but though his turnips weighed no less than 28 tons 15 cwts. 2 qrs. 24 lbs. per acre, he was unsuc-

cessful. The crops of recent years, though very fair, have not been equal to those of the first rotation. The improvements were finished a few years ago, and now the farm—a most complete one in every way—comprises an arable area of upwards of 500 acres, almost all of which Mr Brown has reclaimed at his own expense, and a good many years must elapse before he can be refunded for his enormous outlay. The fields were all fenced with dykes and flags, while service roads were constructed where necessary all over the farm. The soil is very light, and is a mixture of clay, loam, moss, and shingle, with an excessively firm subsoil. The rock comes so near to the surface that in draining it was found necessary to cut a groove in the slate. Mr Brown erected an excellent farm-steading and a very handsome dwelling-house. A few of the fields have been drained a second time, a step necessitated chiefly by the retentive nature of the subsoil. Passing on from these improvements, which have formed the largest speculations ever attempted in the way of land improvement by a tenant in the county, we come to the small farm of Wester Barrowston, where slight improvement has been made of recent years. Next comes Barrowston farm, leased by Mr Mackay, and extending to 300 acres arable. About 150 acres were reclaimed here by the tenant between 1859 and 1866, while the old land has been improved by draining, fencing, and squaring. Additions have also been made to the houses.

Pursuing our course eastward and passing Kennachy, on which there are a number of small tenants who have not been behind their bigger brethren in the way of improvement, we come to Skail. This farm was leased by Mr Laing in 1859, with an arable area of about 200 acres; and it now extends to 400 acres. Besides draining and fencing the new land, he has greatly improved the old land and made large additions to the farm-houses. Next we come to Hallam, a farm of 200 acres, occupied by Mr Dunnet. The tenant erected a new steading at his own expense, and has improved a good deal during the past fifteen years. A short distance farther on lies the farm of Lybster, the most of which has been under cultivation for some time. It is leased by trustees of the late Dr Milne, along with the Mains of Forss and the farm of Hollburnhead. Improvements of recent years have consisted of a little reclaiming, extensive draining and fencing, and some building. We have now detailed the improvements on the Dounreay estate, and before leaving it we may remark, that in no other district of the county have the past fifteen or twenty years worked a more striking change. The broad expansive plain between Sandside and Barrowston, once a barren outrun, is now a rich arable valley, boasting of two or three large farms as neat and regular as ever it has been our fortune to see. Crossing the river Forss, which divides the parishes of Reay and

Thurso, we land on the estate of Forss, the property of Mr Sinclair, who has been a zealous improver of land, and who has done much for the welfare of those on his estate and all around him. During the past twenty-five years he has introduced considerable improvement in the management of his estate, as well as reclaimed and improved a considerable portion of land. Between Forss and Brimsness lies the fine farm of Brims, which was recently greatly extended and immensely improved by the proprietor under the superintendence of Mr Morris. The tenant of this farm is an extensive cattle-dealer, and feeds a large number of excellent cattle. He grows heavy crops of turnips, and consumes them mostly by cattle.

Continuing our journey over the hill of Forss, and passing a number of small farms and crofts, the neatness and regularity of which bespeak taste and ceaseless toil, we come in sight of Thurso and surrounding district. From the hill of Forss we see a wide extensive district of cultivated land to the right and immediately in front; while to the left we have a full view of the stormy Pentland, of the towering cliffs of Dunnet Head, and of the distant Orkneys, robed like "mountains in their azure hue." The first farm of any note that we come to here is Scrabster, belonging to the Crown, and occupied by Mr Hay. It was leased by him fourteen years ago, having been previously held for a long time by the late Mr Dunbar, who made extensive improvements in reclaiming, draining, fencing, and building. When Mr Hay entered, the arable area was scarcely 700 acres; now it extends to 1000 acres. Besides improving these 300 acres, Mr Hay drained the whole of the old land, fenced the most part of it, erected a very excellent farm-steading, and five cottages for farm servants. The greater portion of the new land is sown out in grass, being of an inferior character—a mixture of moss, light loam, and clay, with a retentive subsoil. The old land is good, and produces excellent crops.

The land in the immediate neighbourhood of Thurso has been under cultivation for a much longer period than twenty-five years (the period over which this report extends), and therefore we pass it over without any special remark. It may just be mentioned that it is neatly laid out, finely fenced, and very judiciously farmed.

First in the parish of Thurso we shall notice the Ulbster estates. These are the property of Sir J. G. Tollemache Sinclair, Bart., M.P. (grandson of the late Right Hon. Sir John Sinclair, Bart. of Ulbster, the eminent and celebrated agriculturist), and extend to 75,000 acres or thereby, of which about 15,000 acres are arable, and about 60,000 acres consist of pasture, lochs, rivers, plantations, and roads. A very considerable extent of land has been drained and enclosed on these estates within the past

twenty-five years, and especially during the last ten or twelve years, while the extent of waste land reclaimed has been very large indeed. The draining and fencing have effected an immense improvement on the productiveness and value of the land. Since 1849 upwards of 100 new dwelling-houses, chiefly for the smaller tenants, have been erected, while an equal number of farm-steadings have been either wholly or partially constructed. The dwelling-houses have all been built of stone and lime, the dwelling-houses being slate-roofed, and the office houses either slated or roofed with what are termed shed-covers, this being another name for slates of considerably larger dimensions than the ordinary-sized slates. Each dwelling-house on the smaller farms as a rule is 40 feet in length by 20 feet in width (external measure), and consists of three or four apartments, two of them measuring about 16 by 13 feet each, and the others about 10 feet square within. The dwelling-houses on the larger farms are of much larger dimensions, consisting of from five to nine apartments, varying according to the size and importance of the farm, and the wants and requirements of the tenants and their families. The office houses generally embrace barn (or mill), byres, stables, cart-sheds and other small houses, with cottages for the farm servants employed on each farm. The minute details of the buildings on these estates are given as affording a pretty correct indication of the general style of houses on the principal estates in the county. Notwithstanding all that has already been executed in the way of house building, draining, enclosing, and other general improvements, much still remains to be done towards rendering the improvements complete, and Sir Tollemache Sinclair seems determined to accomplish this ere long. At the present rate of progress the whole should be satisfactorily overtaken within the next ten years, when every tenant on the property will be amply accommodated with substantial and commodious farm buildings of every description requisite for their respective holdings. The proprietor has lately entered into arrangements for further drainage of waste land, preparatory to its being improved and brought under cultivation; and he and the able factor on the estate, Mr Logan, are now (Oct. 1874) in treaty with tenants and others for the erection of about 100 additional dwelling-houses of the most modern and approved designs. Sir Tollemache has made at his own expense during the past twenty-five years upwards of 30 miles of road, at a cost of about L.100 per mile. During the last three years he has contributed L.6000 towards the Sutherland and Caithness Railway, now in active operation, besides giving about 20 miles of his land to the line free of charge, the value of which is moderately estimated at L.4500. The expenditure on improvements on the Ulbster estates within the past twenty-five years is difficult to

ascertain with precise accuracy, but from the investigations we have been able to make it is certain that upwards of L40,000 have been expended by the proprietor alone in permanent improvements, exclusive of L5000 and upwards of Government money. And supposing the tenantry to have expended equal to one-fourth of the amount disbursed by the proprietor, the aggregate expenditure would thus considerably exceed L50,000. If to this is added the L10,500 contributed by Sir Tollemache to the local railway, the total expenditure for improvements is not less than L60,500—a very large outlay indeed, though probably not equal to the amount expended by Sir Tollemache's grandfather (the late Sir John Sinclair) during an equal period of time while carrying on his extensive improvements on the estates. Sir Tollemache is presently engaged in the construction of extensive additions to Thurso Castle—the ancient family residence,—and these, when completed next year, will render the castle one of the most spacious and handsome buildings of the kind in the north of Scotland. The rule on the Ulbster estates is to grant leases of from fourteen to nineteen or twenty-one years' duration, according to the amount of rent and extent of improvement contemplated. The rotation or system of cropping followed is in conformity with the fifth or sixth shift, according to the nature or quality of the soil. The fields are generally well and judiciously laid out, varying in extent from 15 to 30 acres, in proportion to the size and importance of the farm. The farms and crofts are upwards of 200 in number, of which there are twenty farms that are let on leases of nineteen years' duration at rents of less than L600 and more than L200, fifteen farms at less than L200 and more than L100, twenty at less than L100 and more than L50, thirty at less than L50 and more than L20, and 125 farms and crofts varying from L20 downwards. The principal farms on these estates on which the chief improvements in the way of draining, reclaiming, enclosing, and building have been executed of late, or are in course of completion, are:—

Tenant		Acres.	Rent.	
Skinnet and Braal,	Mr Waters,	1400	L 750	0 0
Geiston,	Mr M'Beth,	1300	530	0 0
Stanland, &c,	Mr Sutherland,	725	450	0 0
Aimster,	Mr Mackay's Representatives,	725	400	0 0
Buckies,	Mr Davidson,	540	300	0 0
Thurso East Mains,	Mr M'Kidd,	400	305	0 0
Glengolly, &c,	Mr Mill's Representatives,	335	305	0 0
Ormslie, &c.,	Mr Moore,	420	295	0 0
Oldfield, &c.,	Mr Ferrier,	240	223	0 0
Ulbster Mains,	Mr Shearer,	630	213	0 0
Subster,	Mr Campbell,	200	212	0 0

A few of the larger sheep and pasture farms on the Ulbster

estates, on which considerable improvements have been made during the past twenty-five years by surface draining and fencing are—Strathmore, leased by Messrs Clyne, at a rent of L.630; Dalnawillan, by Messrs Elder, at L.547; Rumsdale, by Messrs Grant, at L.557; and Achlibster and Honstry, by Messrs Munro, at L.330. The rental of these estates, in the parishes of Thurso and Halkirk, twenty-five years ago, including the rent of Ulbster Mains and White Leens, in Wick parish, was L.6750. In the year 1869–70 it was L.11,544 (including the rental of Rumsdale and Achlibster, purchased in the interim by Sir Tollemache for about L.20,000). At the present time the rental of the Ulbster estates has increased to L.14,283, including about L.1500 derived annually from pavement quarries on the estates. The value of the property, it will be observed, has greatly increased during the past twenty-five years—partly owing to the large and judicious expenditure of considerable sums of money on drainage, enclosures, house-building, and in other ways, and partly, no doubt, also owing to the natural upward tendency of rents, in obedience to the general prosperity of the country. It is very gratifying to know that, while there has been such a large increase in the rental of late years, the numerous tenantry on the estates are in prosperous and comfortable circumstances; and most heartily do they co-operate with the proprietor and factor in their laudable endeavours to improve the land. In connection with our account of these extensive improvements, it is but right to mention that they have been carried out chiefly under the management of Mr Logan, factor, who has had charge of the Ulbster estates for the last fourteen years, and who deserves credit for the energy, skill, and care displayed by him in the discharge of these duties. Sir Tollemache is a most considerate, painstaking, liberal landlord, and has signally sustained, indeed added to, the truly national prestige of his family.

At the north-east point of the parish of Thurso lies Sir R. C. Sinclair's compact little estate of Murkle, already spoken of. With the exception of the Mains, occupied by Mr Henderson of Stempster, Broynach, Westburn, and Stilley, the holdings on this estate are small, the rents ranging from L.60 downwards. Sir Robert also owns the estate of Stevenson, in Haddington, and is an energetic, popular landlord.

Leaving Thurso, we next enter the parish of Olrick, in which is situate part of the estate of Rattar. The improvements on this estate have already been noticed, having been effected by "Shirra Traill" previous to 1849. It may be mentioned in a word here, that the farms are all kept in excellent order, thoroughly fenced, well housed, and in many cases drained a second time. During the past eight or ten years the rental of this estate has increased from L.8214 to L.9589. One of the finest and neatest farms on

Rattar is Thurdestoft, which was taken on lease by the late Mr Purves on the completion of Mr Traill's improvements, and which he left to his youngest son, William Purves, on his death in 1862. Mr William Purves, an excellent farmer, also holds the farm of Lochside and the Mains of Barrock. Several other farmers in this parish have proved themselves skilful and energetic agriculturists—notably, Mr Gunn, Greenland, and Mr Thomas Purves, Hoy. Mr Thomas Purves, in addition to his Caithness holdings, leases the large sheep farm of Rhifail in Sutherlandshire, and has a superior stock of sheep. Mr Smith of Olrick, a most indefatigable landlord, has made valuable improvements on his neat little property, one of the most valuable in the county for its acreage. The extent is 2734 acres, and the annual value L2274, 19s.

Pursuing our course eastwards, we enter the parish of Bower. The principal estate in this parish is that of Barrock, belonging to the heirs of the late Sir John Sinclair. The Mains, extending to about 600 acres arable, is held by Mr William Purves, who "hoggs" it, and works it with six pairs of horses. The other farms are chiefly small, the rental, with one or two exceptions, being under L80. The late Sir John had a peculiar taste for reclaiming and improving land, and spent a great deal of pains and no little money in the improvement of his property. He reclaimed one farm of 300 acres—Quintfold—from moor and moss, draining, fencing, and providing it with excellent house accommodation. Quintfold is now held as a "hogging" farm by Mr Gunn, tenant of Kilgour, in Sutherland, and produces very fair crops. Sir John also some years ago added two large fields to his home farm; while his tenantry, assisted and encouraged by him, have done a good deal during the past twenty-five years in the way of reclaiming and improving land. Sir John planted a number of acres around his residence many years ago, and Barrock is now one of the prettiest spots in the county. The spirited baronet's principal improvement was the straightening and deepening of the run of a burn which passes through a level portion of his estate, and which greatly damaged the surrounding plain by overflowing. Sir John cut a straight run, varying from 18 to 40 feet wide, and constructed an embankment about 20 feet from the edge of the run, and from 14 to 18 feet wide at the base, 7 feet high, and tapering to 3 feet in width at the top. A large open ditch 12 feet wide by 6 feet deep was cut along the back of the embankment, for the purpose of carrying away the water from the under drainage of the arable land, until the proper run should become deep enough for the whole stream. The scheme proved highly successful, about 3000 acres of land hitherto almost useless being converted into excellent pasture, while some of it has been reclaimed. Sir John also drained the loch of Alterwall, on the

north side of his estate. The water was first turned out many years ago, but was allowed to run in again. In this way it lay until a few years ago, when the water was turned out at considerable expense, and between 12 and 14 acres of the land was cultivated. The soil is excellent sharp argillaceous loam, and produces grain and turnips, which are scarcely equalled on any other part of the home farm. The late baronet improved the sheep runs on his property by surface draining. On a considerable portion of the home farm whins and other hedging were sown, but as no dyke or flag fence was erected to shelter the plants in their youth, they withered and grew very unsatisfactorily. The houses on this estate are not very good, while there is also need for more fencing. At the farm of Keiss, a short distance below Barrock, where improvements have been going on of late, one of the neatest farm-steading in the north was erected a few years ago.

On the farm of Stanstil, in the neighbourhood of Barrock, Mr D. S. Wemyss, the spirited proprietor, effected considerable improvements during the earlier part of the last twenty-five years. He reclaimed a little, drained it all, and squared and fenced it, as also erected some houses. The farm is now occupied by Mr Leith, who has made various improvements.

We next come to notice the improvements effected by Mr Clyne, Reaster, which have been extensive, and very valuable. In 1841 he obtained a fourteen years' lease of the farm of Hoy, in the parish of Halkirk, from the trustees of the late Sir George Sinclair of Ulbster—the rent being £55. The extent of the farm was about 200 acres, about 50 being arable. During the first eight years of his lease Mr Clyne reclaimed 73 acres from hard hill ground, at a cost of £600, and built a steading at £150. He left this farm in 1853, getting £51 as compensation, and leased the farm of Reaster, from Mr Traill of Rattar, at a rent of £350, the extent being 750 acres, of which 400 were arable. He drained the land, at a cost of £400, put in a new thrashing-mill, and cut a water-course at an outlay of £305. Two years before the expiry of his first lease—nineteen years—he obtained a renewal, and since then (1872) has expended £300 in draining the arable land. Mr Clyne holds the farm of Brabstermire, on the estate of Brabster in Cannisbay, as a sheep run, for which he pays a rent of £160. Here he spent very nearly £400 in surface drains, and put up 100 chains of flag fence, at an outlay of £35—the proprietor paying one half the cost of the fence. In 1862 he leased Strathmore, in the parish of Halkirk, from Sir J. G. Tollemache Sinclair, on a lease of nineteen years, at a rent of £521. On entering this farm he paid a grassum of £560. Since then he has expended £360 in surface drains. Of this outlay the proprietor refunded him £220. He also holds the farm of Borgie, from Mr Smith



of Olrick, at a rent of L.420. This farm, which extends to nearly 600 acres arable, was thoroughly drained and fenced by the proprietor while it was in his own hands, and Mr Clyne on his entry paid L.280 of valuations. In 1872 he leased the farm of Tollichen, in the parish of Halkirk, as a sheep run from Sir George Dunbar of Hempriggs, at a rent of L.150. Here he expended L.80 in surface draining. In the same year he leased Westerdale, in the parish of Halkirk, from the late Mr James Henderson of Westerdale, at a rent of L.330, the extent being about 1200 acres, of which 200 are arable. On this farm Mr Clyne laid out L.120 in draining the arable land and surface draining the waste land. Several other farmers in this neighbourhood have been improving less or more of late. Mr Grant, by patience and perseverance, has extended Bowermadden from a mere croft to an excellent farm, doing everything at his own expense—draining, reclaiming, fencing, and building.

Steering our course northwards we reach the farm of Lochend, in the parish of Dunnet, occupied by Mr James Purves. It, along with Seister, form a small property, belonging to the trustees of Miss Sinclair and Mr Ferryman. When it was leased by Mr Purves in 1851, the extent of Lochend was 260 acres arable, 40 acres of waste in-land, and 600 acres of hill pasture. He obtained an advance from the proprietor of L.400, at  $6\frac{1}{2}$  per cent. interest, under the lease for the completing of the draining and fencing of the arable land, and by 1859 the whole was accomplished, and the 40 acres reclaimed, drained, limed, and fenced—thus increasing the arable area to 300 acres. A new lease of nineteen years, and another advance of L.400 at 6 per cent. were obtained, and by 1864 other 82 acres were added to the arable extent. The remainder of the property, the Seister townlands, extending to 914 acres, was also let to Mr Purves in 1865, and then by agreement he expended L.400 of his own capital in the reclamation of 43 acres, which he divided into two fields, draining and enclosing them. The land reclaimed was partly of a mossy character and partly loamy, with  $2\frac{1}{2}$  feet of dense subsoil clay. With the exception of one field, which was drained with stones, the whole was drained with pipe-tiles, two inches bore being the smallest used. The land was then ploughed, and sown with five bushels of oats per acre, and manured with about 2 cwts. of Peruvian guano. Some portions were top-dressed with from 4 to 6 tons of shell-sand or marl per acre before being ploughed at all, while others were top-dressed in the second furrow. The most of the land was trench-ploughed the second year, and sown with turnips, getting 1 cwt. Peruvian guano, 1 cwt. dissolved bones,  $1\frac{1}{2}$  cwt. bone meal, and  $1\frac{1}{4}$  cwt. bone dust, along with 15 tons of farm-yard manure per acre. The first crop of oats averaged a little over

3 qrs. per acre, and after turnips over  $3\frac{1}{2}$  qrs., the weight of the grain averaging about 42 lbs.—nearly 2 lbs. heavier than the grain grown on the old land. The turnips did not turn out well at all, but the grass grew fairly. Mr Purves himself reported at considerable length on these improvements (see “Transactions of Highland and Agricultural Society” for 1869), and, therefore, it would be unnecessary to enter fully into detail here. It may be mentioned, however, that Mr Purves’s statement of cost and produce shows that the cost of the reclamation of the 82 acres was L.460, and that of the 43 acres L.418—total, L.878. From the produce of the first rotation of the 82 acres he calculated that, besides paying 6 per cent. interest on the loan of L.400 and the rent of the land, he had a prospect of being repaid his own outlay of L.478 at 10 per cent. during the currency of his lease, and also of a margin for profit on account of the labour of the undertaking. He also calculated that the profit of the reclamation to the property, at the expiry of the present lease, should be thus:—

Rent and interest charge on the 82 acres, . . .	L.38	10	0
Do. on the 43 acres, . . . . .	48	16	0
	<hr/>		
	87	6	0
	<hr/>		
L.87, 6s. of yearly rental, at 30 years’ purchase, . .	2619	0	0
Less, L.15, 10s. original rental, at 30 years’ purchase, .	465	0	0
	<hr/>		
	L.2154	0	0

Since 1869 Mr Purves has reclaimed about 75 acres, and made various other improvements. He erected a steam mill of ten horse power, and made additions to the farm-steading, at a cost of L.450, for which he gets compensation at the end of the present lease. In 1865 he, by authority of the proprietor, drained the loch of Seister, at a cost of L.84, whereby 269 acres of solum were dried. About 150 acres of this was found to be suitable for cultivation; and in 1867 another extension of a lease for nineteen years was obtained, and L.1500 advanced from the Drainage Commissioners to under drain these 150 acres and another adjacent piece of land. Besides paying interest on the loan, Mr Purves was bound by this lease to expend L.400 of his own capital on enclosures, road making, &c. The under draining of 150 acres were carried out accordingly, the drains having been constructed with consummate skill and care. The cultivation was chiefly executed by the Earl of Caithness’s steam cultivator, and then barley and grass seeds of various kinds were sown. The barley grew pretty well, and did more than pay the cost of seed and labour. The grasses also came away very well the first year, and yielded an excellent crop of hay. During the past year or two, however, the sown grasses have

been gradually dying out in favour of wild grasses, and now the ground is covered with excellent natural foggage. The margins of the loch, and the portions deemed unfit for cultivation, were subject to drifting, and to prevent this, were sown with grasses simultaneous with the sowing of barley on the cultivated land. The grasses grew pretty well, but have now also almost wholly disappeared. With the exception of a few spots, the whole of the loch now affords fair pasture for sheep, and in a few years it promises to become a valuable addition to Mr Purves's already extensive sheep run. The soil of the reclaimed portion of the loch is argillaceous loam with a mixture of peat, moss, and mud, and would no doubt repay regular cultivation, but in the absence of a saving clause in the lease Mr Purves is reluctant to undertake it. One of the most beneficial results of draining the loch has been the improving of the climate of the locality, as we have already noticed. Mr Purves, besides leasing the pasture lands of Dorrery noticed above, also holds the arable farm of Barrogill Mains, and a large sheep run between Lochend and Barrogill.

We are now in the parish of Cannisbay, the seaboard of which resembles that of Latheron, being principally taken up by small crofts, and leased by fishermen. There are only four large arable farms in the parish, namely, Barrogill Mains, leased by Mr Purves; Philip's Mains and West Cannisbay, held by the Earl of Caithness; and Freswick Mains, occupied by Mr Alexander. As already mentioned, the whole of Philip's Mains was reclaimed by steam power. The noble Earl—a spirited agriculturist—took this farm into his own hands about eleven years ago, and immediately improvements were commenced. The plan comprised 500 acres, of which only a few small spots were previously under cultivation. First of all, a service road was made through the centre, and the fields were laid off, varying from 14 to 35 acres. The land was then thoroughly drained with tiles, the drains being from 21 to 32 feet apart, and from 3 to 14 feet deep, the latter depth being required in mossy portions. Ploughing then followed, the work being executed by Howard's patent plough, drawn by steam. After lying a year or so in the maiden furrow, and re-cultivated and manured with about 5 cwts. of guano, dissolved bones, and superphosphates per acre, it was sown with oats. Next season another crop of oats was taken, the land being harrowed with strong harrows and edged tines, which cut the "feals," and reduced the land to an excellent tilth. The crop this time was better than the first. The third year's turnips were sown with artificial manure, and with the exception of some spots afforded an excellent yield. The greater portion of the 330 acres, now under cultivation, has been gone over a second time, and the experience has been highly

satisfactory. A few of the fields are very hard, and subsoiling is to be tried this season. Before being touched the land varied from hard moor to swampy moss, which in some places measured close on 20 feet in depth. The moss was so excessively soft on a few spots that it was dangerous to pass over it with horses, while the crops seldom came away properly. This danger, however, has been obviated, and the land greatly improved by a large quantity of clay having been driven on, and mixed with the moss. The whole of the land was limed with from 12 to 14 bolls per acre, but some fields are in want of a second dose. The farm has been nearly all fenced with dykes and flags. Steam is still used in ploughing, grubbing, harrowing, and other work, and is found to economise labour considerably. The plough hitherto worked by steam was a single furrow one, but the Earl has ordered a new one for three furrows. About 40 acres of moor and moss have been lined off for improvement, and has all been drained, and part of it ploughed, while the remainder will be ploughed, and the whole cropped next spring. His lordship also erected an excellent steading and servants' cottages, and now the farm is as neat and complete as any in the county. Adjoining this farm lie several hundreds of acres of waste land, all suited for cultivation—at least quite as good as that now bearing excellent crops on Philip's Mains—and there is little doubt that before many years a considerable portion of it will be brought under the plough. The Earl of Caithness has also drained, fenced, and otherwise improved his farm of West Cannisbay, and encouraged his tenantry in improvements of various descriptions. On Freswick Mains Mr Alexander has drained and fenced a large portion of late, while on the estate generally a good deal of reclaiming, draining, fencing, and building has been going on during the past twenty-five years. It is worthy of mention that Mr Sinclair of Freswick is just now erecting a handsome new hotel, at John o'Groat's House, for the convenience of visitors to that quaint spot of world-wide renown.

In noticing Cannisbay we must not neglect to take a look of the small island of Stroma, which stands out in the Pentland Firth about a league from the mainland, and which is part of this parish. It contains about seven square miles of surface, and the greater portion of it is cultivated, usually producing excellent crops. These, however, frequently suffer damage from salt spray, which rises furiously in rough weather from its irregular precipitous coast.

While, however, enormous improvements have been made of late, much still remains to be done. It is computed that there are upwards of 40,000 acres of moor and mountain heath in the county deserving of and suitable for improvement. A consider-

able part of it might pay regular cultivation, but the greater portion is better suited for grass than for growing grain and turnips. Undoubtedly there is much room for improvement on the sheep runs by way of surface draining and fencing. Many hundreds of acres are at present next to useless, owing to their excessively wet nature. If surface drained these would make excellent pasture.

**PUBLIC ROADS AND FARM BUILDINGS.—Roads.**—As already mentioned, that able baronet, Sir John Sinclair, also took the initiative in the improving of the Caithness roads. Up to 1790 the roads in this county were wretchedly bad, in fact, scarcely deserving of the name. Sir John attempted to construct roads by the statute labour of the district, the first one lined off being from the hill of Bein Cheilt across the moss of Causewaymire towards Thurso. This, however, was found impracticable, and in 1793 an Act was obtained by which statute labour was converted into a money payment by occupants of land, at the rate of 30s. sterling for every L.100 Scots of valuation held by the occupants of land, and by cotters and the inhabitants of towns at the current rate of wages for the six days' work. This assessment, as it might be called, raised a sum of L.500 a year, and by it the work was carried on. Again, in 1803, an Act was passed appropriating for that year L.20,000 towards making roads and bridges in the north of Scotland, it being provided that one-half the cost of the roads and bridges should be borne locally. In 1806 another Act was passed, by which authority was obtained for constructing six roads in Caithness, one-half the expense of which was to be paid by the Parliamentary Commissioners, under the provisions of the Act of 1803, the other half being paid by the county. The harvests of 1816 and 1817, however, were so excessively bad, and so oppressive on the county, that only one of these six roads was made under the Act. This road commences at the Ord, runs along the coast to Wick, and thence through the centre of the county to Thurso. The half the cost of this road, known as the Parliamentary Road, amounted to L.16,437, 9s. 9d., and was paid by the landed proprietors of the county. Matters remained in this unsatisfactory state until 1830, when an Act was obtained for the repair of the old roads and the making of new ones by an assessment on owners and occupiers of land, amounting to an annual sum of L.1500, exclusive of the commutation of the statute labour money on cotters and inhabitants of towns. No fewer than 137 miles of roads were made under this Act, and from the completion of these to the present day, Caithness has been second to no other county in Scotland with respect to roads. The routes were judiciously selected, and the roads made in a most substantial manner, which the experience of the past thirty

or forty years has amply testified. Notwithstanding that on some of these roads the traffic has all along been very considerable, they have required but very little casual repair, and are still as substantial as when first made. The assessment on occupants was sufficient to meet the expense of maintenance and repair of these roads, but no funds were available for paying off the money borrowed to make roads. The proprietors, as enterprising a class of gentlemen as well could be desired, were not to be baffled. They agreed to double the assessment payable by them under the Act of 1830, for paying the borrowed sum in twenty-one years, and an Act was obtained in 1838 to substantiate this, and place the newly-made roads under the management of the Commissioners for the Repair of Highland Roads. The Act of 1838 expired in 1859, the whole sum borrowed having been paid off. In 1860 an Act was passed "laying a uniform assessment on the real rent of all lands and heritages in the county, payable half by owners and half by occupants, and consolidating all the funds and roads into one trust and system of management, and giving power to remove tolls when a fair and adequate substitute for the revenue they produce shall have been provided." It was also stipulated by this Act that one or more tenant farmers should be elected by each parish, in addition to the former road trustees who were proprietors. Since the passing of this Act matters have gone on smoothly and satisfactorily. Several new pieces of road have been added to the list, which now extends to 270 miles, while the old roads have been kept in excellent repair. Tolls continued to exist on the roads till the September meeting of the trustees last year, when, after considerable discussion, the abolitionists (who suffered a defeat the previous year) gained the day, and those obnoxious hindrances, which are being swept from the highways all over the country, were catalogued among the things that were, so far as Caithness was concerned. The assessment for maintenance and repair of the roads has been at the rate of 9d. per pound, since the institution of the road trust in 1860,—the abolition of the tolls having necessitated no rise in the taxation. One half of this rate is borne by the owners, and the other by the occupiers of land. As illustrating the burden which fell on the landed proprietors of Caithness in making roads, and the small assistance they obtained from inhabitants of towns, the following fact is interesting. In 1819 an Act was passed appropriating L.5000 to provide for the maintenance of the Parliamentary Roads in the Highlands and in Caithness, that sum to be paid annually by the Barons of the Exchequer in Scotland, and requiring the balance in each county to be assessed on the proprietors of land and houses in the county and boroughs, according to the return of rentals for the

income-tax in 1814. The whole of this assessment had to be paid by the landward heritors in Caithness, there being at that time no owner of house property in the towns of the county who was assessed for the income-tax.

*Buildings.*—In no matter whatever connected with agriculture in Caithness is there more need for improvement than in houses. The importance of a commodious, convenient steading on a farm is very great indeed, and is fully appreciated only when enjoyed for some time. True, a vast change has been effected in the character of the farm-houses during the past twenty-five years, but still there is much need for further improvement. The larger farms generally throughout the county have pretty fair houses, some of them excellent. There are others, however, on which the buildings are in a deplorable state. On a few farms which require two pairs of horses the whole stock of houses stand in in one row, pretty long, but not by any means wide. The dwelling-house, stable, byre, barn, hen-house, pig-house, &c., are all under one roof; and if it were not for the appearance of an apology for a chimney on the top, one would have some difficulty in discerning from a few hundred yards which part of the structure is set apart for the human inhabitants. This state of matters, I gladly own, exists only in a very few cases, and there seems every prospect of these being obliterated soon. In numerous instances, however, the pile of buildings comprising the abode of the farmer and the office houses is astonishingly small and dilapidated. The buildings are narrow, the side walls low, and the roof of the ancient round style. The parts of the gables above the side walls are in many cases *fial* or turf. The thatch is either straw or rushes or other wild stuff, and it is tied down by ropes made of heath or of straw, with pieces of flags attached to a "mink" at each end, the flags being substituted for pins to hold the ropes tight. The crofters' houses, with few exceptions, are very far from what they ought to be. The dwelling-house is usually very small and feeble-looking. The only office houses on the building are attached to the end of the fire-house, and are not much to boast of. Some of them are neat and comfortable, but others are neither. The dwelling-houses of the crofters, however, though not by any means prepossessing from the outside, are frequently found to be clean and tidy in the inside. The interior arrangements betoken cleanliness and rustic simplicity such as is to be met with in few countries. The entrance to not a few of the crofters' houses is through the byre. There are generally two rooms, but sometimes only one, which is divided into two or three compartments by box-beds and presses. The fire-place is in the middle of the floor, and the smoke escapes through a hole in the roof—sometimes directly over the fire, but as often at the other end of the room. The windows are generally small,

and in some cases there is no such thing to be seen. As illustrative of the state of some of these cottages, I quote the following from Mr Campion's report, referring to a small crofter's house which he visited in the parish of Dunnet:—"A considerable portion of the room in which the family were sitting was occupied by a sow with a litter of eight pigs. There was no window, and the only access for light and air was through a hole in the roof by which the smoke escaped." Fortunately, however, such dark pictures can now be drawn less frequently than in 1869.

The new steadings in Caithness are of the most modern construction, and are comfortable, commodious, and substantial in every way. Where water is not obtainable the thrashing-mills are driven by steam, and in many cases are fitted up with complete dressing machinery and elevators. Thus the grain is separated from the straw, dressed, and conveyed to the granary or deposited in the sack, in perfect preparation for the market, without any manual labour whatever, excepting, of course, the feeding of the mill. There are also a few horse mills in the county, these being chiefly on small farms. The stables on a number of the finer farms are exceedingly good, large, well-ventilated, and substantial. Byres are also very good on some holdings, but less attention is paid to the housing of cattle than of horses. The dwelling-houses on the large farms, as well as on the small ones, were generally very miserable till about twenty-five or thirty years ago. Since then, however, no lack of spirit has been shown in this way, and now a large number of as handsome residences as are to be seen anywhere will be found in this county. A good many of them are surrounded with fine hedging and small planting, which add immensely to the appearance of the building, and greatly improve the fertility of the tastefully laid out garden. A few of the landed proprietors' residences are secluded and beautifully wooded. Building material is obtainable in Caithness comparatively easily. The wood has all to be imported, but stones are found almost everywhere in the county. The rubble work is constructed for most part of the flagstone of the county, and the corners are usually built with the native freestone. The native slate has also been used as thatch, but it is heavy, and requires not only very strong couples and sarking, but also finely-built walls. Another objection is, that it is porous, and yields to the pressure of the weather, and becomes dingy and ugly in colour. Small unimportant houses are generally covered with native slates, measuring from 18 inches to 2 feet long by 14 to 20 inches broad. In by far the majority of cases imported slates are used, the most popular variety being the Welsh slate. Lime for building purposes is also imported, and costs about 3s. per boll. The general arrangement between landlords and tenants in Caithness as to building houses is that



the former meet all expenses, while the latter perform all the cartage, and pay interest on the outlay. There are a few exceptions to this rule, but not many. In a few cases the proprietor has erected houses without any interest from the tenant, according to stipulation on entry; and in numerous instances the tenants have made additions to and repairs in their steadings from their own purse. A few of the very best steadings in the county were erected by the proprietors themselves while the farms were in their own hands undergoing improvement, but there is no doubt that the vast change for the better which has taken place of late years among the farm-houses in Caithness is due in a great degree to an intelligent, enterprising, well-to-do class of tenants.

**DRAINING AND FENCING—*Draining.***—To economise space and save repetition of names, I noticed the principal undertakings in draining and fencing, as well as house-building and road-making, in detailing the land improvements; and, therefore, nothing remains to be done here but to give a general idea of the modes of construction. It is worthy of remark, that Caithness was among the first counties to apply for money from the Government Drainage Loan of 1848. In less than twenty years upwards of L.70,000 were borrowed from the Government by proprietors in this county, and expended by them or their tenants in drainage, the tenants paying  $6\frac{1}{2}$  per cent. interest, and the proprietors affording security. This, in itself, is a sufficient proof that the spirit of improvement has been keen in Caithness for many years. Besides this L.70,000 of borrowed money, the expenditure of the proprietors' own capital in draining during the past five years must have been very large. There is no data upon which a calculation of this expenditure could be based, but it may be mentioned that between 1830 and 1870 upwards of L.260,000 was expended in drainage, fencing, and buildings. In some parts of the county draining is rendered a matter of extreme difficulty, in consequence of the horizontal flags coming so close to the surface; while in others it is made very expensive by a dense retentive clayey subsoil. The distance between the drains varies from 20 to 36 feet, according to the character of the soil, the average depth being 3 feet—varying from 2 or  $2\frac{1}{2}$  to 3 or  $3\frac{1}{2}$  feet, according to the porous or retentive character of the subsoil and the depth obtainable without coming into contact with the solid rock. When the rock comes within 2 feet of the surface, tiles are laid in a groove cut in the rock for them. The object of this is to ensure safety for the tiles from the agricultural operations. On some estates tiles varying from  $1\frac{1}{2}$  to 3 and 4 inches have been used for all in-draining, while in others—the Ulbster estates, for instance—by far the greater proportion have been formed with stones in the bottom. These latter drains are generally known

by the name of "coupled drains," that is, drains formed by placing a couple of flat flags opposite each other, on edge, in the middle or bottom of the drain, and afterwards placing smaller stones on the sides and over the top. This species of drains, if well and carefully executed, is very effectual, and gives general satisfaction for many years. The leader drains in most cases are generally formed of stones and built. Leader and other drains are also sometimes formed of tiles shaped like the letter "U," the mouth being turned down. The cost of drains per chain is generally from 3s. 6d. to 5s.—the average being 4s. The drainage, generally speaking, has been well executed, has proved very beneficial, and ultimately will amply repay both proprietor and tenant. There is one thing in connection with the efficiency of draining which deserves the careful attention of farmers—the thorough clearing of ditches and outfalls. It is of the utmost importance that the water, on emerging from the leading drains, should have free course; as, when it is impeded, the drains are choked and rendered useless.

*Fencing.*—Perhaps there is no county in the north of Scotland better supplied with fences than Caithness. With the exception of a few small farms, the whole arable land of the county may be said to be enclosed. The fences consist of stone-dykes, hedges, flags, and wire. Fences constructed of wire are necessarily limited, for two reasons. In the first place, wood, as we have frequently observed, is not grown in the county; and secondly, in such a county shelter is obviously a great consideration. For the most part stone dykes form the ring fences, while the interior or subdividing fences are generally constructed of flags and hedges, or hedging alone. The flag fences consist of large thin pavement or flag-stones, about 4 feet in height, set on edge in a trench previously dug, the stones being erected perpendicularly, and well secured in the ground. Whin-seeds are generally sown on each side of the flags, the whins being very useful in supporting and protecting the flags; while the flags shelter the plants in their youth, and so facilitate their growth. In a few years the whins grow up 2 or 3 feet above the flags, and the two together form a most substantial fence, very valuable as affording shelter for the stock. These fences cost from 4d. to 6d. per lineal yard, and last for many years, though not nearly so long as the more substantial stone-built dykes, which, including the quarrying, cost about 2s. per lineal yard for dykes standing 4 feet in height, exclusive of the "cope." On a good many farms the fences are formed wholly of hedging—whins, thorn or beech, or these mixed together. It is only in some cases, however, that hedging survives the spring blasts when not sheltered in their youth by flags. Perhaps the most popular fence of all is the flag and whin fence. The croppings of the

whin hedges make excellent fodder for horses, and are utilised in this way by many farmers. Some of them "supper" their horses every night from November till February with whin-croppings. One unfortunate result of the extensive use of whin hedges has been to spread and foster rabbits. These destructive creatures were not by any means plentiful previous to 1830, but now the county is swarming with them.

**GRAIN CROPS—Wheat.**—This variety of grain was tried pretty extensively in Caithness some fifteen or twenty years ago, but now it holds a very secondary place among the cereals. In 1856, the extent under wheat was 617 $\frac{3}{4}$  acres; in 1857, 380 $\frac{1}{2}$  acres; in 1868, 79 acres; in 1869, 28 acres; in 1870, 22 acres; in 1871, 22 acres; in 1872, 68 acres; in 1873, 82 acres; and in 1874, 87 acres. The average yield per acre is scarcely 3 $\frac{1}{2}$  quarters—too low to be a remunerative crop. So far north, however, as latitude 59°, it could scarcely be expected that such a fine variety of grain as wheat would grow satisfactorily. The east winds in spring are much too cold, while sunshine is not sufficiently plentiful for wheat; but, however fine the climate might have been, Caithness could never have ranked high as a wheat-producing county, the soil being unsuited for this variety. Wheat requires not only a fine climate, but also a considerable depth of soil;—its roots are of a piercing nature, and, pushing themselves down through the soil, abstract the nutriment from a great depth. The soil of Caithness, generally speaking, is very shallow, and the subsoil is too dense to allow roots to spread freely in it, and hence its unfitness for wheat. Wheat is generally sown after turnips, the "clean ground" being best suited for it. When turnips are eaten off by sheep, wheat should not be sown on that land. Full value is not obtained of the droppings, as these are confined to the surface, and therefore it does not come into direct contact with the roots of the wheat. "Clean land," well manured with farm-yard manure and lasting artificial manure, when put under turnips, is the most suitable for wheat in this county. The varieties most in favour are the red and white wheat. The seed is generally sown in autumn and winter, and the wheat is usually the first ready for the reaper. A large quantity of flour is used in Caithness, the home supply being a mere trifle compared with the consumption.

**Barley.**—Caithness has been an important bere and barley producing county for more than 200 years. In 1856 the extent under bere or barley was 1983 $\frac{1}{2}$  acres; in 1857 it was 2818 $\frac{1}{2}$  acres; in 1868, 781 acres; in 1869, 1778 acres; in 1870, 1737 acres; in 1871, 1966 acres; in 1872, 1639 acres, in 1873, 1744 acres; and in 1874, 1895 acres. Barley has not been gaining much favour in this county during the past twenty-five years, just maintaining its position, and little more. It grows mode-

ately well, and is of very fair quality, the average yield being about 4 quarters per acre, and the standard weight about 50 lbs. per bushel. Almost every year a considerable quantity, however, falls a little short of this weight. The soil on the finer districts of the county is peculiarly fitted for barley, and were the climate more genial and sunshine more abundant, luxuriant crops would be certain. A soft friable soil, not above a medium loam, is best suited for barley, the roots of which instead of piercing, as is the tendency of wheat, spread laterally and extract the food from the surface. Barley requires nutritious feeding, and hence it is always sown after turnips, the land being then in good heart. The practice, so prevalent in Caithness, of eating the turnips off the land by sheep, is peculiarly advantageous to growing barley. The land is generally put in a high state of stimulation by the sheep, and the manure, being confined to the surface, is easily within the range of the barley roots. In many of the finer counties damage is frequently sustained to the barley crop by the land being too rich when manured by sheep, but in Caithness the crop is threatened by no such danger, the only difficulty being in obtaining a proper tilth after the treading of the sheep. A fine tilth is essential to the successful cultivation of barley, and a good deal of labour is sometimes entailed in Caithness in obtaining this. The Caithness farmers are fully aware of the advantages to be derived from judicious changing of seed, and many of them spare no expense in procuring the very finest samples to be had from warmer climates. The seed is changed every two or three years on several farms. The common barley (two-rowed) and the bere or "bigg" (four-rowed) are varieties chiefly used, the latter from its hardier qualities being the most in favour. Chevalier, as being superior in distilling qualities, is gaining popularity here as elsewhere. A considerable quantity of bere and barley is exported every year, while a large number of quarters is consumed at Mr Henderson's distillery in Wick. Barley is sown from the middle of March up to the last week of April, and is usually ready for mowing by the 8th or 10th of September, sometimes earlier. Barley, as well as wheat, is both sown and reaped by machinery.

*Oats.*—This variety is the standard grain crop of Caithness. It suits both the soil and the climate better than either wheat or barley, and for every acre sown with these two latter varieties upwards of thirty are put under oats. The area under oats in 1856 was 19,258½ acres; in 1857, 22,153½ acres; in 1868, 31,952 acres; in 1869, 32,734 acres; in 1870, 32,635 acres; in 1871, 33,094 acres; in 1872, 33,116 acres; in 1873, 33,007 acres; and in 1874, 33,071 acres. The produce of oats has increased about one-third during the past twenty years, which is partly attributable to the decrease in the area of wheat, but chiefly to the

increase of the arable acreage of the county. Oats grow well, and are generally of good quality, though seldom exceeding 42 lbs. per bushel in weight, the standard weight being 40 lbs. The yield varies from 3 to  $5\frac{1}{2}$  quarters per acre. The preparing of the seed land receives a good deal of attention, and certainly no labour could be more advantageously expended. A considerable portion of the land for the oat seed, with the exception of the turnip ground, is ploughed in autumn, and exposed to the ameliorating influences of the winter; and, when the land is clayey or stiff, the effect is favourable. Spring-ploughing, however, even of lea, is usually preferred. The turnip land is all ploughed in the spring, many acres of it being turned over the one day and sown the other. This has been found by experience to suit admirably well, the portions sown in this way generally affording the heaviest yield. Scarifying has been tried, but light ploughing is preferable. The land is well harrowed and reduced to a fine tilth. The roller is used on almost every holding, some of the farmers going over the ground twice with this implement. There is no doubt but fine soil is beneficial to the growth of grain, and an even surface proves a great advantage in harvest in facilitating the operations of the reaper. Sowing is generally commenced about the 20th of March, and is carried on till about the end of April, the quantity of seed per acre ranging from 5 to 6 bushels. The lea land and stubble fields, where the rotation is on the six-shift principle, are sown first, the turnip land being left untouched as long as possible to accommodate the sheep in eating off the turnips. Harvest is generally begun about the second week of September, and finished about the middle of October. By this season of the year the weather often becomes rough and unsettled, making the successful harvesting of grain a matter of extreme difficulty. Many of the more enlightened farmers take the precaution to cut their grain before it is thoroughly ripe, or "dead ripe," as it is called, but still a good many hang on in hope of the proper maturing of every ear. It is a notorious fact that an amount of grain, which it would be impossible to calculate, is lost or greatly damaged every year throughout the north of Scotland in consequence of delay in harvesting,—a delay not caused by sloth or laziness, but by a reluctance on the part of farmers to mow the grain until it becomes dead ripe, believing that to cut corn before it reaches that stage entails a loss. The contrary, however, is in reality the case. When not fully matured before being cut, the grain ripens sufficiently in the stook, and yields more corn and better straw than if left on the root till it is "dead ripe." When the grain is left uncut till thoroughly ripe, the top-ears are stripped and shedded in the harvesting operations, and thus the very best of the crop is sometimes lost. But the chief advantages of early

cutting are, that shaking by wind is often avoided, and that there is a chance of the grain being ready for the stack sooner than if left on the root till every ear is ripe. The damage by "shake" is sometimes heavy in this county, while the grain is frequently rendered inferior by discolouring and sprouting. When wet weather sets in, the grain is sometimes built in "screws" on the land, two or three cartloads being put into each. This prevents sprouting, and preserves the colour of the grain, but the additional turning over entails a considerable amount of loss by shedding. The varieties most commonly in use are Early Angus, the Common Oats, Sandy Oats, Kildrummy Oats, Red Oats, Potato Oats, and Birley. The Early Angus yields well and ripens speedily. The Common Oats produces a large return of straw, while the Kildrummy variety is most productive both in straw and grain, and is specially adapted for thin land. Potato Oats yield exceedingly well, but are very susceptible of damage by wind, and therefore are not cultivated so extensively as they would otherwise be. The seed is changed every two or three years, and is usually taken from the Lothians. Seed from Orkney, Morayshire, Aberdeenshire, and other places in the north, has also been tried, but the change from the south suits best. The produce of grain in this county is scarcely equal to the consumption, but yet a considerable quantity is exported, some of it as seed for earlier counties, and some of it as meal. The importation of grain is therefore pretty large, the greater portion of it being foreign oats—Danish and Russian. The quantity of the home produce available for human food is also lessened a little by a considerable number of quarters being annually eaten by cattle and sheep, especially the latter. Horses also consume a great quantity of grain.

*Rye, &c.*—Very little rye is sown except where no other crops will grow—on mounds of sand and shingle. In 1865 there were only  $21\frac{1}{2}$  acres under this crop; in 1868 the extent rose to 117 acres; but in the following year it fell to 60 acres. In 1871 the extent was 34 acres; in 1872, 27 acres; in 1873, 69 acres; and in 1874, 70 acres. The crop is usually a fair one, not very heavy, but of good quality. The rye is chiefly consumed in the county. Beans and peas are grown to a slight extent, and are used wholly at home. Since 1856 the annual area under beans has not exceeded 4 acres. In 1856 the area under peas was  $31\frac{1}{4}$  acres; in 1868, 66 acres; in 1870, 36 acres; in 1872, 31 acres; and in 1874, 27 acres. A small patch of tares is also grown on the most of the farms, the total annual area being upwards of 300 acres. Tares are included in the green crop returns.

During the last twenty-five years the total area under all kinds of grain crops in this county has increased close on 14,000 acres. In 1856 the extent was  $22,235\frac{1}{2}$  acres; in 1869,  $34,644$  acres; in

1872, 34,881 acres; and in 1874, 35,150 acres—increase during the past five years, 506 acres.

**HAY AND GRASS.**—In a county so largely devoted to the rearing of sheep as Caithness, it could scarcely be expected that hay could be very extensively grown. A moderate quantity is grown on every farm, but the produce of hay is not equal to that of some other counties of a similar size. When carefully cultivated, the crop is generally pretty heavy, and of very superior quality. The extent of hay and grass under rotation in 1856 was 18,713½ acres; in 1857, 21,234½ acres; in 1868, 27,211 acres; in 1869, 26,028 acres; in 1870, 27,646 acres; in 1871, 26,418 acres; in 1872, 26,169 acres; in 1873, 26,144 acres; and in 1874, 27,744 acres. Perhaps no kind of crop whatever tests the manurial condition of the soil better than hay. When the land is not well cultivated and liberally manured, it is almost useless to think to obtain even a fair crop of hay, or a continuous covering of grass, unless the land be naturally very rich. The adaptation of the land for hay and grass, and the selection of seed, have been receiving a good deal of attention from the Caithness farmers of late. It is impossible to lay down any given rule for the mixing of grass seeds, the different kinds of soil requiring different mixtures, and therefore great care has to be taken in selecting the proper variety for the soil to be sown. From 30 to 35 lbs. of seed is generally given to the acre, according to the character of the soil, the quality of the seed, and the purpose in view. Heavy wet land gets a little more seed than dry light land; and when the land is to lie under grass for a number of years, the mixture has to be slightly changed and increased. The following is a mixture largely used in this county in regular rotation:—

	lbs. per acre.
Common Ryegrass Seed, . . . . .	12
Italian do. . . . .	8
Biennial Red Coloured Seed, . . . . .	8
Alsike or Hybrid, . . . . .	2
White do. . . . .	2
Trefoil or Yellow, . . . . .	2
	—
	34

Of course, many other kinds of mixtures are sown in the county than the above. In fact, almost every farmer follows some plan of his own. When the land is to be left under pasture for some time, the weight of Alsike and white clover is increased about 2 lbs. in each case, while 2 or 3 lbs. of perennial red clover is substituted for the 8 lbs. of the biennial variety, and 6 or 8 lbs. of different kinds of meadow grass added. A variety of meadow grass, known by the name of "rough stalk meadow grass" or "sodgers," is greatly in favour, and suits damp soil well. A lb. or two of field parsley does very well in pasture grass, and is tried

on a good many farms. A great diversity of opinion exists as to what depth the seeds ought to be covered, the general opinion being that when covered to a depth not exceeding  $\frac{1}{2}$  inch, the seeds germinate quickest, and thrive best afterwards. When covered to a depth of 1 inch or  $1\frac{1}{2}$  inch, as is done in some cases, the seed is slow in sprouting, and some of it never appears at all. Farmers also differ as to the time at which seeds ought to be sown, some holding that they should be sown immediately after the grain, while others maintain that the most advantageous way is to delay sowing them as long as they can be harrowed in without damaging the grain. Mr Miller of Dounreay sows his grass seeds along with the grain, and his hay crops are scarcely equalled by any in the county. His mode of procedure is first to sow the grain and harrow it thoroughly, following the harrows with the roller, then to sow the grass seeds on the rolled land, covering them with chain harrows, and lastly, rolling the land again. The grass seeds are thus covered at a uniform depth, and therefore come up more regularly than they do in ordinary cases. A number of other farmers pursue the same course, and find it to suit admirably well. A very small proportion of the hay crop is seeded, the most of it being cut early for eating purposes, in order to obtain an aftermath. The seed is almost all imported. The hay is consumed in the county partly by the horses, the cattle, and the sheep.

**ROOT CROPS—*Turnips*.**—Caithness has long been famed as a turnip-producing county. The soil is well adapted for them, while they are less susceptible of damage by the climate than grain crops. They have always been sown at a great breadth, and have yielded extremely well. In 1856, the area under turnips was 7839 $\frac{1}{4}$  acres; in 1857, 8820 acres; in 1868, 12,561 acres; in 1869, 12,831 acres; in 1870, 12,874 acres; in 1871, 13,042 acres; in 1872, 13,247 acres; in 1873, 13,751 acres; and in 1874, 14,045 acres. The area has been gradually increasing in a uniform ratio with the increase of arable land. About one-fifth of the arable land is generally devoted to turnips—one-third of that portion being swedes, and the other two-thirds being Aberdeen golden-yellow, purple-top yellow, and globes of various kinds. The swedes frequently weigh as much as 28 tons per acre, while the yellows sometimes reach 36 tons per acre. A challenge cup is competed for annually by all farmers in the county with yellow turnips, and the average weight of the competing fields has generally been about 25 tons per acre—an average that would compare perhaps with any other county in Scotland. The annual average weight for the whole county is considered to be slightly higher than any other county in Scotland, even the famous turnip counties of Aberdeen and Banff included. In 1856 the total average per



acre was 18 tons 18 cwt., or fully 1 ton 8 cwt. above Selkirk, the next highest county in Scotland in that year. While, however, the Caithness turnips weigh well, many experienced agriculturists hold that they will not compare with the turnips of Aberdeen or Banff in feeding properties—a phenomenon attributed to the want of granite in the Caithness soil. The Caithness turnips are considered to be rich in phosphates, and specially adapted for rearing large bony cattle, but are comparatively devoid of beef-producing properties. Whether this be due to the character of the soil or to some other cause, it is not very easy to ascertain, but many of the Caithness farmers are satisfied with the truth of the statement. The preparing of the turnip land is an important matter, and entails a large amount of labour. The stubble land is usually ploughed at a considerable depth, in the autumn or winter, and thus exposed to the pulverising effect of the winter. Some farmers plough the land across the rig, while others, believing that this cross-ploughing prevents the successful clearing of the land, plough parallel to the old furrow. The land is again ploughed or grubbed in the spring, some running across the field, and others along the furrow. When the land is dirty, a second grubbing is given it by some farmers, and the weeds gathered, and either burned or driven off the fields. This system of frequent overturning and cross-steering is believed by not a few to be instrumental in breaking and spreading the weeds, and thus strengthening their hold of the land rather than being of good service in their extermination. Scarifying has been tried on a few farms, and found to suit admirably well. Scarifying is generally executed at a depth of from three to six inches, within five or six weeks after the removal of the grain in autumn, and when the land is in a very foul state, it is scarified twice, and harrowed with chain harrows two or three times during the winter. In the spring the land is ploughed and prepared in the usual way. The scarifying economises labour, and is a most commendable method of preparing the land. As yet it has been tried on only a few farms in this county, but is likely to become much more general at no distant date. The sowing of the turnips is usually commenced about the 20th of May, and concluded about the 20th of June, the seed being now all sown with machines. The farm yard manure is seldom so abundant as to go over the whole of the turnip land, and therefore a large quantity of artificial manure is required. When 10 to 15 tons of farm-yard manure is given to one acre, 5 cwt. per acre of dissolved bones, bone meal, and bone dust is deemed sufficient, the quantity being considerably increased and supplemented with a few bushels of whole bones, when no dung is spread. Swedes sometimes get as much as 20 tons of

farm-yard manure, and 6 or 8 cwt. of artificial stuffs per acre. The hoe is now almost exclusively used in the thinning process, though some years ago thinning by the hand was pretty general in some districts. The greater portion of the turnips are eaten off the land by sheep; a considerable quantity, however, being stored for the cattle, or for eating by sheep on lea or stubble fields when the turnip land is wet. When the land is soft or mossy, the turnips are all driven off the land and stored in pits, varying from two to twenty loads, and covered with earth. When stored on the land, the pits range from one to three loads. Storing generally commences about the end of October or the 1st of November, and some farmers have their crops stored before Christmas, save the portion to be eaten on the root by the sheep. Very little of the turnip crop is driven off the fields.

*Rape, &c.*—Rape, cabbage, mangold, and carrots are sown to a slight extent, and grow well. In 1856 the area under these varieties was  $25\frac{1}{4}$  acres; in 1868, 111 acres; in 1871, 66 acres; and in 1874, 79 acres. Rape is very rich in feeding properties, and usually occupies upwards of 60 acres. The cultivation of rape would no doubt pay farmers well, but when grown at great breadth there is a danger of the turnip crop being deteriorated by strayed seeds of rape, which shake out in the harvest operations, and lie dormant under grass, germinating when the land is broken up and sown with oats or turnips, thus strengthening the natural tendency of the turnip plant to degenerate and revert to its original state and character of rape. In Ireland, where rape is grown extensively, it is no unusual thing to find rape plants here and there on turnip fields—a fact attributed to the practice of sowing that variety of root crops. Mangold is grown only in very small quantities. It has been tried by a number of farmers, but given up by the most of them, in consequence of its tendency to seed too soon.

*Potatoes.*—This esculent is grown in sufficient quantity only to meet the home consumption. In 1856, the area under potatoes was  $1282\frac{1}{2}$  acres; in 1857,  $1571\frac{1}{2}$  acres; in 1868, 2226 acres; in 1869, 2493 acres; in 1870, 2489 acres; in 1871, 2590 acres; in 1872, 2514 acres; in 1873, 2087 acres; and in 1874, 2190 acres. The soil of Caithness is well suited for potatoes, and the yield is usually excellent, second perhaps to no place in Scotland, the Orkney islands excepted. The weight per acre is sometimes as much as 11 tons, while the quality is superior. The favourite varieties are Orkney Reds, common Regents, and Paterson's Victoria Regents. Other kinds are grown on some farms to a slight extent. The Orkney Reds are the most prolific variety, and can be sown longest on one farm without deteriorating. Seed is frequently changed, and is taken from Orkney and

the Lothians. From 15 to 20 loads of farm-yard manure, and 2 or 3 cwt. of artificial manure are generally given to the acre of potatoes. Crofters and the labouring classes live largely on potatoes, while potatoes and fish constitute the staple meal of the fishing population. Scarcely any potatoes are exported, but for what is exported the top prices are obtained. Disease seldom does much damage to this crop, but frost sometimes checks the growth prematurely.

Since 1849 the annual area under green crops has increased by nearly one-half. In 1856, the area was 9510 acres; in 1869, 15,263 acres; in 1871, 16,034 acres; in 1873, 16,304 acres; and in 1874, 16,746 acres.

**CATTLE BREEDING AND CATTLE FEEDING.**—For at least fifty years back cattle breeding has been a special feature in the agriculture of Caithness, while feeding has occupied quite a secondary position. The rearing of cross stirks for sale, in lean condition, is second only to the extensive breeding of sheep in the programme, if I may be allowed the expression, of the Caithness farmers. It affords a quick overturn of money, a handsome revenue for outlay, and suits the characteristics of the county admirably. The number of cows kept in the county is very large, and at one season of the year the stock of young cattle is correspondingly numerous. In 1856 the total number of cattle in the county was 15,694; in 1857, 18,196; in 1868, 21,226; in 1870, 19,731; in 1872, 20,630; in 1873, 22,037; and in 1874, 22,616. Since 1849 there has been an increase of considerably upwards of 8000. I have already referred to the inferior character of the ancient cattle, and to the efforts of Sir John Sinclair to improve them, stating that his experiment of crossing the native cows with Galloway bulls had turned out unsatisfactorily. The climate of Caithness did not suit the Galloway, and though Sir John succeeded in improving the size of his cattle, and in making them better suited for farm work, he reduced their milking and fattening properties. The West Highland breed, being a kindred race, were much more suitable than the Galloway for effecting the first step of improvement in the Caithness cattle, and as a natural consequence Sir John's experiment with the Kyloe bulls proved highly successful. The chief characteristics of the West Highlanders are thoroughly hardy constitutions, thick hides, with long soft hair, short muscular limbs, wide chests, deep and well-arched ribs, straight back, and strong quarters. Thus, then, the West Highland bull was readily recognised as possessing all those important points in which the ancient Caithness cow was deficient. The West Highlanders are slow in arriving at maturity, and their first crosses with the Caithness cattle showed little improvement in this way. The crosses, however, were much larger than had ever been raised in the county before, and of course it was im-

possible to bring every point to perfection at once. They gradually improved in feeding properties, and when carefully kept for four years or so, finer beef could scarcely have been got. The Argyleshire blood was preferred for the lowland farms, and that from Skye for the hilly holdings. As might have been expected, the stock raised on the former places were larger than on the latter. The Caithness farmers continued breeding from West Highland bulls until their stock of cattle was almost entirely of Kylee blood, and in fact very fair specimens of the shaggy tribe. No other notable step was taken in the breeding of cattle till about 1820, when the first shorthorn bull was introduced by the late Mr Horne of Scouthall. Mr Horne naturally believed that the speedy beef-making properties of the shorthorn would materially improve the West Highland breed, increase their size, and accelerate their maturity. Shorthorn bulls were put to the home-bred cows, and the progeny fully equalled the most sanguine anticipations. They were larger and finer shaped than the ordinary cattle of the county, and matured and fattened much more rapidly. While they inherited the weight, quality, and early maturity of the shorthorn, they retained the hardy constitution and broad chest of the West Highlander. The outward shapes, as a matter of course, resembled those of the sire, though at first a good deal of coarseness was observable. Careful breeding, however, removed these objections, and by 1830 the shorthorn cross had got so much in favour in Caithness that the general cry was for shorthorn bulls. Mr Horne fed his crosses, sending them to London, where he usually obtained the top prices of the day. In 1838 he entered the Smithfield market with a lot of 20 four-year-old cattle, and had the unprecedented honour, at least so far as the north of Scotland was concerned, of carrying home £40 for each of them. The fame of the Caithness cross was thus established, and dealers from far and near flocked to the county in search of lots for sale. The number of shorthorn bulls annually introduced gradually increased, until they have now almost wholly superseded all other sires. By 1849 the majority of the principal farmers reared from cross West Highland cows and shorthorn bulls, though the Kylee bulls were still to be found on a good many farms. They, however, as well as the West Highland cows, gradually decreased in number, just in proportion to the increase of shorthorns, and now they may be almost said to have ceased to hold a place among the live stock of the county. For several years back the cows have principally been crosses, descended originally from Kylee cows and shorthorn bulls. Crossing and re-crossing with these animals has gone on from year to year, and unless very great care be taken, there is a danger of the breed of the county being seriously deteriorated. When too often crossed, or, in other words, reduced to a relation-

ship too close to the pure shorthorn, the animals are apt to become weak in the constitution, narrow in the frame, flat in the rib, and too long in the legs, unless great care is taken in the selection of the sires. So long as the bulls are good the danger is not so serious. For some eight or ten years past the Caithness cattle could scarcely have been equalled in a commercial point of view, possessing, as most of them did, many of the principal characteristics of the shorthorn—the characteristics adapted for commerce—and the hardy constitution of the Kyles cow. The obtaining of a really good shorthorn bull has long been a great aim with a large number of Caithness farmers, but it is equally true that a few are too indifferent with regard to this important point, as, in fact, is the case almost all over the northern counties. During the past three or four years a larger number of ordinary or second-rate bulls have been used in Caithness than for some years previous, and though not yet felt to any great extent, the result is beginning to make its appearance. These remarks apply with equal force to every county north of Perth; and, perhaps, to nothing is it more largely due than to the by far too extensive breeding of shorthorns at random throughout the whole country. Were a much smaller percentage of the number of shorthorn bulls that are bred now-a-days sent out through the country for breeding purposes, and this percentage employed more largely, or as largely as they were some eight or ten years ago, there would be fewer of those light-waisted, weakly-constitutioned, ill-shaped animals which are so obnoxious on the market day, and which are to be met with in almost every county in Scotland. The result of using inferior bulls is doubly damaging when the cows are of an ordinary character; and though certainly not inferior to the general run of cows in the north, the Caithness cows are not of so superior a description as to make up for the deficiency in some of the bulls, and hence a number of the young stock at the present day is scarcely what could be wished for. The legs are too long, the bones too big, the ribs too flat, and the chest too narrow. These animals have a wonderfully good appearance when young—one year old—being high above the ground, but by the time they reach two years, when the frame is in a more advanced state of development, the deficiencies appear more prominently, and it is then, and then only, that the mistake of keeping inferior stock is thoroughly understood. The remedy required to effect the desired improvement in these deficient stocks is quite clear, and but for the expenditure entailed in the procuring of it the improvement would have been effected long before this time. The obtaining of superior shorthorn bulls will not do it alone. Better cows are also requisite. As already stated the cows have been too often crossed from the original breed. Starting perhaps with a second-class female

animal—a first or second cross from the Kyloe breed, and an inferior bull,—crossing has gone on on the female side in successive generations, in many cases until the constitution is so grievously weakened and the general character and outline so deteriorated, that it is quite needless to think that these animals could produce profitable stock, however good the bull might be. The only course, therefore, is to revert to the original Kyloes, or to introduce some new and different breed. Some farmers are trying the former plan, while others are experimenting with improved crosses. Still better, however, I think, than either of these, would be the introduction of superior black polled cows. It is a singular fact that this profitable breed of cattle, so popular in Aberdeen, Banff, and Moray, is almost entirely unknown in Caithness. The sleeky polls have never taken a place among the live stock of this county, as their kindred race, the Galloways, once did. A few have now and again been strewed over the county, but I believe I am not far wrong in saying that the total number has never at any one time exceeded fifty. It is generally admitted that, taking every thing into account, the most profitable cross of the day is a cross between a shorthorn bull and a polled cow. The hardy constitution, the superior quality of beef, and breadth of frame of the poll, amalgamates with remarkable readiness with the early maturing qualities, weight, and excellent style of the shorthorn, thus forming a cross second to no other description. The position these animals—peculiar to the north of Scotland—take at the annual fat stock shows in England is sufficient testimony of their superiority. One objection which some Caithness farmers have to breeding from polled cows is, that they are of opinion that the crosses between them and shorthorn bulls are slow in growth, and therefore not suited for their system of selling off in stirks. There is no doubt that the special feature of the crosses with the polled cow is their adaptation for remunerative feeding; but though they sell them in stirks, they are purchased for feeding purposes, and it is but natural to suppose that a higher price would readily be paid by feeders for an animal well adapted for feeding than for one with no such features recommending it. The belief that those crosses are slow in growth is not very largely shared in by the general farming community, while it is regarded as groundless by almost all of those who have had practical experience in the matter. The milking qualities of the first or second cross cows between polls and shorthorns are also good, while the animals are quiet and peaceable. The cross between a West Highland cow and shorthorn bull reaches maturity much earlier than the original Kyloes, and is in many ways a most profitable animal. It is, however, generally less than the polled cross, and seldom pays the feeder so well. One strong objection to the extensive use of Kyloe

cows is, that it is a matter of extreme difficulty to catch them in proper season, and so secure a calf at the right time. Many of them pass seasons without having calves at all, especially when their calves of the previous year are allowed to suck, and this has often to be done on account of the furious temper of the cows. The special recommendations of the Kyloe crosses are that they are well adapted for cold climates, and do not necessarily require high feeding. Polled bulls have also been tried in Caithness, and an improvement was effected in some ways, while in others their influence was unfavourable. They improved the constitution of the crosses, but reduced rather than increased their weight. It is a recognised fact in breeding, that the constitution of the progeny is similar to that of the dam, and the frame or general outline after that of the sire. Therefore it is clear that the most judicious system is to cross with a shorthorn bull of good shape and a polled or some other cow with an equally good constitution. The improvement of the class of cows in Caithness is likely to be a question of some importance very soon, and hence these remarks we have ventured on. It must be remembered, and I mention the fact with pleasure, that the remarks as to the inferior stock do not apply to Caithness generally, only to a small section of the county. The Caithness cattle, generally speaking, will compare with those of any other county north of Aberdeen, while about one-half of them will stand second to an equal number of no other county in Scotland. These may seem strong remarks, but, nevertheless, they are correct; and if proof were wanted, it is sufficient to mention that from L.18 to L.21 are annually obtained for Caithness yearlings about the month of July.

Strange to say, cattle feeding—that important branch of husbandry so popular over the greater part of the north—is comparatively unknown in Caithness. Only a very few farmers pursue it at all, while the total number of cattle fed annually, compared with the whole stock in the county, is very small indeed. The general principle is to rear cross stirks, and sell them off in summer—generally in June or July. During the winter and spring, the more careful cattle breeders give their calves from 1 to 2 lbs. of cake and bruised oats daily along with turnips and straw. The calves are usually dropped before the middle of March, and the following may be regarded as the general system of bringing them up:—“Each calf has 8 quarts daily of warm milk divided into three meals direct from the cow. Some allow the cows to suckle their calves. The calves are kept on warm milk for about fifteen weeks, but when they are three weeks old they get a little oilcake made into jelly with hot water, at any or all of the meals. The quantity of cake given is gradually increased until it reaches first half-a-pound and then a

pound per day. At the end of fifteen weeks skimmed milk is substituted for the warm milk, and this, along with cake, is continued for a month longer. The calves are then well grazed, and generally sheltered at night. Not later than the 1st of November, and even sooner, the daily ration of 1 lb. of cake is resumed, which is continued until the stirk goes to grass next season, and for a fortnight longer if the beast will eat it. When the calves are put on turnips, the daily allowance is about 40 lbs. a head, and this is gradually increased to 60 lbs., divided into three meals, with oat straw *ad libitum*." There are many exceptions to the above rule; some farmers being more liberal in their treatment, and others not so considerate. Grass is generally ready for the cattle about the middle of May, and for a short time the stirks are left out only an hour or two daily if the weather is cold. They are always housed at night for some time, and when the grass is ready to cut they get a small quantity of it in the byres. The supply of grass usually continues up to the middle of September, but for a short time before that house feeding with tares and other stuffs has often to be resorted to. The period of house feeding is thus very long, and no little difficulty is frequently experienced in tiding over the time and maintaining the cattle in uniform condition, or rather in gradually improving them. The principle of continuous feeding from the very first is strongly approved of in this county, and almost every farmer who possibly can carries it out most consistently. This, no doubt, entails a heavy outlay, but no more profitable manner of investing money lies within the range of farmers. Cattle thus regularly fed from their youth upwards, but not too highly fed, are much in favour with fleshers and dealers, and hence the established fact, that Caithness farmers usually obtain from 10s. to L.1 a head more for their stirks than those of any other county in the north, and from L.3 to L.4 more than dealers receive for Irish cattle of a similar age. A large number of stirks from this county are annually brought into Aberdeen, Banff, Moray, Inverness, and Ross for feeding; and as illustrating their comparative superiority of out-coming qualities, a fact communicated to me by an Aberdeenshire farmer is worthy of mention. Towards the end of the autumn he purchased a few Caithness stirks and a few Irish beasts of about the same age, and as near to the same size as could well be imagined, and tied the whole up together, feeding them with the same material. The result was that when selling time came, the Caithness beasts drew L.5 a head more than the Irish. The difference in the buying price was about L.2, 10s., the Caithness stirks being, of course, the dearer. Other similar instances could be mentioned. Mr Henderson of Bilbster has one of the finest stocks in the county on his farm of Westerseat, and rears his calves in a most sys-



tematic manner, feeding them very highly all along, and selling them in July or August at about L.19 per head, the weight ranging from  $4\frac{1}{2}$  to 6 cwts. One lot of Mr Henderson's stirks was sold in Aberdeen at L.21, 10s. a head for wintering purposes, while another lot was sold for the flesher at L.19, 10s. Several others in the county, such as Mr Henderson of Stempster and Sir George Dunbar, obtain enormous prices for their yearlings. A good many of the larger farmers keep no more cows than supply their respective farms with milk, and buy in young cattle from the smaller tenants around them to consume their straw and make manure. They generally purchase the stirks towards the close of the summer or in autumn, and keep them throughout the winter, selling them lean in spring, and receiving from 15s. to L.1 for every month's keep.

Perhaps the principal reason for so little cattle feeding in the county is the fact that fully one-half of the turnips is devoted to sheep, and that, therefore, to feed a number of cattle with the other half of the turnips would entail a very heavy outlay for feeding stuffs. It is also held by some that the turnips of Caithness are not so well suited for raising beef as for producing grazing cattle—a feature attributed to the geological formation of the county; and another troublesome barrier was the unsatisfactory means of communication with the southern markets. I mean the communication for fat cattle. The steamboat is disliked both by fleshers and farmers as a means of conveyance for fat cattle. Now, however, that the railway has been opened there will be no room for complaint in this way. It seems pretty evident that there are grounds for the supposition that the Caithness turnips will not compare in feeding properties with those of Aberdeen and Banff; but yet, as experience has shown, they are capable of producing very superior beef, if partly supplemented with cake and other feeding stuffs. The few cattle that are fed at the present day in the county are excellent, and command the top prices. The Earl of Caithness feeds from 60 to 70 two and three year olds annually at his farms in Cannisbay, and they average very close on L.30 a head, the animals going to Aberdeen salesmen, who bring well-nigh L.40,000 worth of cattle every year from Caithness—one salesman alone (Mr John Duncan) having had about L.30,000 worth last year. The tenant of the farm of Brims also feeds a large number, and in one way or other generally puts several thousand pounds worth of fat cattle through his hands in one season. Several other farmers feed a few animals, and though it may be some time in becoming general, there is every reason to believe that feeding cattle will gradually increase in the county. Were cattle-feeding pursued extensively, the already fine crops of turnips would be considerably improved, while their feeding qualities would be greatly enhanced. It is

well known that the value of manure made by feeding animals, especially when cake is liberally used, is much higher as crop-producing material than the dung of the store cattle, and perhaps nothing would be more beneficial to the Caithness land than liberal treatment with superior farm-yard manure. The introduction of black polled cows would also form an incentive to cattle feeding, inasmuch as the polled cross is perhaps better suited for feeding than any other kind of cattle whatever. A few Ayrshire cows are to be found throughout the county, these being used solely for their superior milking qualities.

But I must conclude the general remarks on cattle, and devote a few sentences to the breeding of pure shorthorns, which has lately become a distinct branch in the agriculture of the county. As already stated, the first to introduce shorthorn bulls into Caithness was Mr Horne of Scouthall. His example was early followed by the late Sir John Sinclair, Bart. of Barrock; Sir George Dundas, Bart.; Mr Henderson of Bilbster, Mr Henderson of Stemster, and Mr Adam of Lynegar. The bulls came from Thornington and Sittyton. As illustrative of the character of the bulls introduced, it is sufficient to mention that the famous Sittyton bull "Malachite," the winner of a first prize at the Royal English Society's Show, was purchased by Sir John, and used by him with much success for three or four years. At the local show in 1874 Mr Macbeath, Gerston, took the first prize among aged shorthorns, and the Highland Society's medal with a dark red of good quality and fair shape, bred by Mr Campbell, Kinellar. Mr Henderson of Stemster was first among two-year old shorthorn bulls, and Mr Brown, Watten, coming first among yearlings with a bull bred by Lord Polwarth. For many years shorthorns were used for crossing purposes only, but recently three herds of this breed have been established—one at Sir George Dunbar's home farm of Ackergill Tower, one at Mr Henderson's farm of Westerseat, and one at Mr Adam's farm of Lynegar. The foundations of these herds, as well as almost all the bulls used throughout the county for crossing, have been procured from Aberdeenshire—Sittyton, Kinellar, Little Haddo, Uppermill, and other places. The cows on Ackergill and Westerseat have been brought to their present astonishingly pure condition by careful breeding and judicious selection of bulls; while Mr Adam, besides three cows of his own breeding, has three young females from Sittyton and Little Haddo. Sir George breeds five or six bulls annually, and sells them to his tenants and others in the county, receiving from L.25 to L.30 a head; while Mr Henderson, whose herd is very carefully managed by Mr Morris, annually rears seven or eight bulls. He has been rearing pure shorthorns for eight or ten years, and has now fourteen or fifteen cows for breeding purposes. He has

had several very excellent bulls of late from Aberdeenshire, and breeds very fair stock indeed. He sells his bulls throughout the county, and averaged close on L.28 for his last year's crop—ten in number, while the previous year he averaged about L.35 for six. Besides breeding these few shorthorns, Mr Henderson keeps a large stock of excellent cows, and has divided the honours with Sir George at the local cattle show for some years back. Mr Adam of Lynegar has done little more than made a commencement as yet, but will no doubt prove himself a worthy opponent to his two older and better tried brethren in the short-horn line. He has a very neat well-bred young bull in stock just now out of one of his young shorthorn cows. Such laudable efforts as these for the improvement of cattle farming certainly deserve encouragement and commendation. But it seems very doubtful, indeed, if the breeding of pure shorthorns in Caithness will ever come to be either remunerative to the breeder or beneficial to the county at large. The climate is by far too cold for the successful rearing of really superior shorthorns; and the spreading of an inferior lot of bulls in the county, even though sold at a mere trifle, would be almost ruinous to the farmers. In Caithness the shorthorn is as an exotic plant, better suited for the improving of the indigenous plants, than for being planted and cultivated in its original state.

**SHEEP FARMING.**—Breeding and feeding sheep is and has been for many years the staple branch of agriculture in Caithness. It is doubtful if any county north of Edinburgh with such a large area of cultivated land is devoted so largely to sheep-farming as this one. The whole of the hill pasture, more than a third of the inland grass, fully half the crop of turnips, and a considerable portion of the grain crops, are consumed by sheep. On many farms almost the whole crop is eaten by sheep, and farmers seem to think that they could have no more remunerative way of utilising their produce. Sheep is their hobby; and rather than keep them on scanty pasture, they would devote every atom of the year's crop to their feeding. The general system of sheep management is similar to what will be found in the south of Scotland. In fact, the Caithness sheep farming may almost be said to be a model taken from the south. The following shows the number of sheep in the county since 1856:—In that year there were 73,858; in 1857, 72,730; in 1868, 96,295; in 1869, 92,643; in 1870, 88,016; in 1871, 90,035; in 1872, 101,458; in 1873, 107,491; in 1874, 108,829. The stock of sheep consists chiefly of Cheviots, half-bred and other crosses, the former being in the majority. There are also a few Leicesters; but these, with two or three exceptions, are kept more for crossing purposes than with any other view. As already stated, the ancient or natural breed of sheep was a blackfaced variety known as Kerry sheep,

the whole county being at one time covered with them. The establishing of the present very superior stock is entirely due to the past fifty years. However inferior the native stock of a county may be, it usually takes a very long time to root it out and establish a foreign breed, even though that breed should be of the very first order. The farmers of this county saw that the massive, hardy-constitutioned Cheviot was better suited for remunerative rearing on their expansive wastes than the unshapely, slow out-coming Kerry, and thereupon it was the special work of a period to root out the one and establish the other. Now scarcely a single representative of the ancient breed remains to remind one of their characteristics, while the Cheviots and their crosses have been the staple breed for a much longer period than that over which this report extends. Cheviots were first introduced about the beginning of the present century by Sir John Sinclair, Bart. of Ulbster, on the estate of Langwell; but it may just be mentioned, in a word, that this worthy baronet made an effort before then to improve the breed of sheep by the introduction of the merinos, which were at that time the most fashionable breed in the country, being patronised and cultivated by George III. The land was too wet for them, however, and notwithstanding that Sir John purchased leather and "had them all equipped in boots," they did not thrive. The Cheviots, however, prospered most satisfactorily; and, as already stated, the Langwell flock—the first of the kind in Caithness—was at one time one of the most favourably known in Scotland. The introduction of Leicesters in 1822 by Mr Horne, who was proprietor of Langwell by that time, may be said to have been the starting-point of that most remunerative system of sheep-farming which has won an undying name, not only for Caithness, but for the north of Scotland. For some years the spread of Leicesters was not very rapid, the wet character of the pasture and the want of fencing operating against their being extensively adopted. Draining, however, as well as fencing, was early commenced, and for more than thirty years the Leicester tups have been used all over the county. There are now four or five pure Border Leicester stocks in the county, the first one being established by Mr Brown of Watten about thirty-five years ago. He has continued to breed since, and usually keeps about fifty ewes, selling his tups in shearlings at an annual public sale of Leicesters, the majority of them being purchased by farmers in the county. Sir George Dunbar was the next to follow Mr Brown's example. He has reared his own ewes for a number of years, and has been very successful indeed. He began with ewes purchased by his father upwards of thirty years ago from Mr Davidson of Cantray, and has since drawn blood on the female side from the Learmouth, Haymount, and Sisterpath stocks. He obtains the very finest

tups to be had from Lord Polwarth, Miss Stark (Millendean), Lord Southesk, Messrs Clark (Oldhamstocks), and others. This care and enterprise in the selection of his tups will be inferred from the fact that he purchased the second prize tup, belonging to Messrs Clark, at the Lothian Ram Sales in 1874, at the handsome sum of L.50—a comparatively low figure, however, for the quality of this animal. He is a lengthy tup, of fine quality and excellent shape, and will no doubt amply repay Sir George for his outlay. He also disposes of his tups in shearlings at the public sales, and usually obtains from L.8 to L.14 a head. He retains a few of the finer of the ewe lambs every year, and sells the “shotts” when fat. Sir George had the third prize at the Highland and Agricultural Society’s Show at Inverness in July last, both for ewes and gimmers in well-filled classes. Mr Purves, Thurdestoft, turned his attention to breeding Leicesters a few years ago, and now keeps about 100 ewes, drawn chiefly from the well-known stock of Millendean and Linton, near Kelso. He also sells his young tups at the public sale, and in 1874 topped the list with an average of close on L.9 a head. He competed unsuccessfully at Inverness in the same class with Sir George Dunbar, but carried everything before him at the local summer show. He has employed tups of the first order all along, and had the good fortune to secure, over the heads of a multitude of well-known breeders, the first prize Oldhamstocks tup at the Lothian sales, at the moderate figure of L.60. Mr Miller, Thuster, and Mr Adam, Lynegar, breed just as many Leicester tups as they require themselves. They have about fifty ewes each of the very best description, and procuring tups from the finest stocks of the day, rear very superior tups. Mr Adam obtained the nucleus of his stock from Mr Nisbet, Lambden, who took a very creditable position at the Highland and Agricultural Society’s Show at Stirling in 1873. The tups in general use throughout the county are very superior, perhaps second to those of no other county in the north; and while the Caithness Leicester breeders continue to carry away the stars of the Lothian Ram Sales, there is little fear of any falling off. The majority of the farmers keep pure Cheviot ewes all of a very superior description, and in many cases of their own breeding, and between these and their excellent Leicester tups produce half-bred hogs that are scarcely equalled in Scotland. Leicester tups, especially Border Leicesters, are particularly well suited for crossing with Cheviot ewes. Their characteristics are early maturity and great aptitude to fatten; and when crossed with a hardy Cheviot, the progeny inherits an astonishingly large share of the most commendable qualities of both sire and dam. A number of farmers have been breeding from half-bred ewes for some years, while some have been breeding from cross ewes for a few generations. Experience, however, points towards the

abandonment of this latter custom. The remarks applied to the continued breeding from cross cows hold good in this case also. The longer the crossing is continued, the weaker the constitution grows, while the frame also becomes gradually less and more unshapely. Reverting to the original breed is found necessary in almost every case. Mr Henderson of Bilbster, for instance, used to breed from crosses, and of late has been sustaining considerable loss by his sheep taking "swinglin," or weak backs.

Some ten or twelve years ago Mr Smith of Olrick introduced a flock of Shropshires; but though this breed is hardy, large, and producing good mutton, they did not turn out very well, and the experiment was not persisted in. The hogs are generally kept on till June or July, and either fed and sent in detachments to the Edinburgh sales or other southern markets, or sold at the Georgemas Fair in July. The hogs sold at this fair usually number from 5000 to 8000—purchased chiefly for feeding in Morayshire and in the south of Scotland, while a few of them go to England. The prices obtained for the lean hogs range from 34s. to 45s. a head, the fleece, ranging from 8s. to 14s. in value, being taken off previous to the market. A large number of the hogs are fed very highly, and usually bring as much as L.3 per head, when sold about the month of July. In a few cases this sum has been exceeded, though in others it has scarcely been reached. Some sell in March, and then as much as 56s. per head is obtained. The best idea, however, of the character of the hogs will be had from the fact that they generally weigh from 18 lbs. to 19 lbs. per quarter. The lean hogs, like the young cattle, are very high in repute among the feeders. Lately Mr Adam, Lynegar, supplied the Duke of Sutherland with 300 lean half-bred hogs at 50s. for his Grace's irrigation farm, and in one month they were ready for the butcher.

A large number of the Caithness farms are held as what is locally termed "hogging farms;" that is, they are adapted to the rearing of half-bred hogs. A good many gentlemen hold large sheep farms in Sutherlandshire, and lease arable farms in Caithness for the purpose of wintering and feeding their hogs. Pure Cheviots predominate in Sutherland, half-bred hogs being reared only on a few farms. The hogs are brought down to Caithness towards the fall of the year and kept there until fat, if intended for the butcher; while, if they are to be disposed of as store stock, they are returned to the hills in March or April. A number of farmers also bring down their old ewes and feed them, after taking a crop of half-bred lambs. The sheep are usually dipped once a year with Macdougall's dip and other similar composites. So nearly alike is every farmer's system of sheep management, that it would be quite needless to particularise. The brief out-

line already given, I trust, affords a pretty correct indication of that system. As illustrating the extent to which sheep farming is carried on, it may be mentioned that several gentlemen hold three or four large farms, partly arable, and own many thousand sheep. In speaking of the land improvements, I mentioned the names of the most of those who hold grazing farms in Sutherland in addition to their Caithness arable farms; but two gentlemen, not yet named, deserve special notice here—Messrs Donald and William Mackay, father and son. These gentlemen hold in all about 150,000 acres, pay between L.5000 and L.6000 of rent, and own between 14,000 and 15,000 sheep. Their principal holding is the immense farm of Melness in Sutherlandshire, extending to 77,000 acres, while they also lease the farm of Skelpick in that county. They hold eight or ten farms in Caithness—Backlass and Benalisky (both pasture), on the Ulbster estates; Calder Mains, North Calder, and Achavairan (all arable), on Scots Calder; Lythemore and Stempster, on the Crown Lands; Tower Hill (arable), on Ulbster; and two or three farms joined into one on the estate of Hempriggs. The latter holding, part of which is arable and part moor or moss, was leased at a rent of L.1100 lately. They keep Cheviot sheep principally, and annually feed about 1600 hogs. Mr Paterson, tenant of the large farm of Bighouse in Sutherland, leases the fine arable farm of Rattar Mains, at a rent of L.800, almost entirely for “hogging” purposes.

The quality of the Caithness wool is exceedingly fine—in fact, equalled only by the Australian wool in the markets of the present day. The crosses especially carry wool of most superior quality. The wool is generally sold at the Edinburgh and Leith sales, where it has topped the price-list for many years. The value of the fleeces varies from 8s. to 14s.—a very handsome addition indeed to the value of the animal. The superiority of the Caithness wool is attributed by many to a supposed favourable influence of the clay slate rock which abounds so extensively in the county. Whether there be any truth in this or not, it would be unsafe to pronounce an opinion, but the fact of its superiority remains valid all the same. Sir George Dunbar gained a gold medal for a specimen of his wool at the great Exhibition of 1862.

**HORSES.**—The stock of horses in the county, generally speaking, is very fair. On a number of the larger farms superior animals are employed. In 1856 the number of horses in the county was 2582; in 1857, 3388; in 1869, 5157; in 1870, 4724; in 1871, 4805; in 1872, 4883; in 1873, 4928; and in 1874, 4969. The number in 1811 was 5224, or 265 more than at the present day. The improvement effected in the breed of horses during the past twenty-five years has been very great indeed.

The ancient breed of horses, the Garrons already referred to, were used by some farmers up to a comparatively recent period. Many years ago, however, some of the principal farmers introduced Clydesdales, and of late years this useful breed of horses has been the general stock of the county. A number of the common north country farm horses are used, while a few of other descriptions are to be met with. The local agricultural society has for some years back been offering premiums for improved entire horses to travel in the county, and this step in itself has been productive of much good. Among others, Mr M'Robbie, Sunnyside, Aberdeen, has sent one or two very superior horses into the county, leaving an excellent stock of foals. The average Caithness horse is very hardy, extremely healthy, and lively at work. They are usually carefully and liberally fed, and tide over the spring work quite easily. There is a large number of very excellent ponies in the county.

**PIGS, POULTRY, AND DOGS—*Pigs.***—The native swine in Caithness are short little creatures, slow in growth, and unshapely. In early days they received but little attention from their owners, and usually wandered about all over the farm during summer. Now, however, more care is exercised in their management and breeding, and a superior kind of animal occupies the piggeries. Some of the larger farmers rear a great number, while others feed only a very few. The most of the crofters keep two or three, while the cotters generally content themselves with one. In some cases pure Berkshires are kept, but generally speaking crosses are preferred. A manifest improvement was effected in the class of pigs in the centre of the county, by the introduction, some years ago, of a very fine boar from the Queen's farm at Windsor. There is still, however, good room for improvement in the Caithness pig. A large amount of pork is used in the county, while a considerable quantity is exported. The quality of the Caithness pork, when the animals are carefully fed, is very good indeed.

***Poultry.***—Caithness stands well in poultry. The native hens were little useless creatures, and consequently very few of them are now to be met with. Barn-door fowls of all descriptions are kept in the county; at some farms a very large number of the Spanish breed, Dorkings, Brahmepootras, Chinese birds, game birds, ducks, &c., are reared and fed. Great attention is paid to them, and a large quantity of eggs is annually exported. On the most of the crofts and the smaller farms, and on many of the large farms, a limited number is kept. Pretty large flocks of geese are still to be seen throughout the county, though the number of this variety now reared is very small compared with some fifty years ago. The small farmers generally breed the geese, keeping them up till the end of autumn, when the large



farmers buy them and feed them on the stubble fields. They are usually well fed by Christmas, and at that time they are killed and sent south to the Edinburgh market. The price obtained averages about 6d. per lb., and the weight of the birds ranges from 10 lbs. to 18 lbs.—the average being about 14 lbs. On some farms about the end of autumn, flocks numbering upwards of 200 may be seen strolling over the fields, patiently gathering their seemingly scanty meals. The stubble-fields are now mostly all run by sheep, and consequently less food is left for the geese.

*Dogs.*—As might naturally be expected, with so many sheep in the county, the number of collie dogs in Caithness is very large indeed. The best kinds were brought with shepherds from the south, many of them coming from the Ettrick hills. The native dogs were of a rather inferior character, but when judiciously crossed with the incomers the progeny is excellent. Many of the “brown-eared, ringle-eyed” kinds, so favourably known by the shepherds, are to be found in the county; but, unfortunately, very little care is being shown in the breeding of the canine tribe, and consequently they are deteriorating in character. This is a decided mistake, and one that must very soon be felt. The value of a good sheep dog is inestimable, and this is only properly recognised when a dog is wanted. In fact, dogs are as indispensable to shepherds as horses to farmers, and therefore as strict attention ought to be paid to the breeding of the one as to that of the other. There are a good many small fancy dogs in the county, and the number of hounds, retrievers, pointers, &c., is large. The hounds are very plentiful. A large and liberally supported coursing club has been in existence in the county for some years, and this, of course, has introduced a superior lot of greyhounds. Caithness is peculiarly suited for coursing, and some most successful meetings have lately been held. A pack of harriers also existed in the county for some time, but it was broken up a good many years ago.

*MARKETS, &c.*—Georgemas market has long been one of the principal sheep fairs in the north. It is held early in July on the hill of Georgemas, in the centre of the county, and is the chief market for the sale of Caithness sheep. It is generally stocked with upwards of 8000 cross hoggs, besides other sheep, and brings out a very large number of dealers from all parts of Scotland and the north of England. The amount of business done on the hill is always enormous, generally as much as £20,000 and sometimes £30,000 worth of sheep changing hands in one day. The sheep usually consist chiefly of lean stock, but in forward condition, the fat animals being for the most part shipped to the southern markets. Cattle are also exposed for sale at this market, and a considerable amount of business is done. The buyers of cattle

are principally farmers in Ross-shire and other counties in the north. Monthly markets for cattle are also held in various districts throughout the county at one period of the year. These district markets are generally well attended, both by buyers and cattle, and many large transactions take place. Perhaps the majority of the cattle of Caithness, however, are purchased privately by dealers, who make periodical rounds in the county, and convey their purchases to the Muir of Ord market, where another overturn takes place. Some dealers convey them further south, while, as stated above, a very large number of the Caithness stock are sold at the Aberdeen auction marts, the purchasers there being Aberdeenshire farmers, those in the Buchan district especially.

An agricultural society has been in existence in the county for upwards of forty years. It has a lengthy list of members, and has done noble service to the county in various ways. The annual exhibitions of cattle, horses, sheep, &c., under its auspices have been highly successful for many years. Among the premiums offered are the Highland and Agricultural Society's medals and frequent money premiums. These competitions have created and fostered a healthy rivalry among the farmers of the county, and the contest on most occasions is very keen. The influence such societies have on every branch of agriculture is well known to be very favourable, and therefore they deserve the support and patronage of every farmer, whether great or small.

Grain markets are held weekly on Fridays both at Wick and Thurso, and are usually largely attended by farmers and grain merchants.

LABOUR.—The labour question is happily a matter of small anxiety to the Caithness farmers; at least they have little room to complain, compared with some other counties in the north—Aberdeen and Moray, for instance. A large number of cottages for farm servants have been built during the past eight or ten years; and many of those farmers who have not yet enjoyed this great desideratum, have either made arrangements for obtaining it, or are contemplating the matter. One result of the erection of these cottages has been, of course, to create a keen demand for married servants. Previous to 1855, comparatively few married servants were employed in the county. The labour was executed by single men and women, chiefly the sons and daughters of the crofters and small farmers in the county. A large number of extra hands were required during the harvest in those days; and the home supply being deficient, numbers had to be taken from Sutherland and Lewes. Though all lived in bothies then, there was little ground for complaint with respect to immorality. More than three-fourths of the servants at all times belonged to the county, and were thus restrained

from evil by the influences of home and relationship. These influences, however, gradually weakened and dwindled away in the eyes of the servants, and by about 1860, they were showing anxiety for frequent "flittin'," and seldom were slow to exhibit independence. Farmers began to feel the effect of this, and hence the agitation for cottages and married servants. The want of capital has necessarily impeded the progress of cottage building; but already a gigantic improvement has been effected. On almost all the principal farms, and on many of the small ones, cottage accommodation is complete. The married ploughmen, numbering perhaps two-thirds of the whole, stay in these cottages, with their wives; while the single servants reside in bothies, generally in close proximity to the grieve's house. Where this state of matters prevails, the experience has been most satisfactory. The married servants are found to be regular and attentive to work; while the single men, who are under the charge of a married grieve, behave in a commendable manner. Were landed proprietors and tenants in other counties as energetic and zealous in the erection of farm servants' cottages, and, in fact, as considerate of their best interests as these respective classes have been in Caithness, less would be heard of those obnoxious master and servant cases; while the tide of emigration, which yearly sweeps away thousands of our best men, would receive a substantial check. In some of the northern counties—notably Aberdeen and Moray—a very large number of the farm servants may indeed be said to have no home. They wander about over the whole country, serving in the one district the one half year, and shifting to the other the next. They are thus continually moving about among strangers, in the presence of whom they become quite regardless of their conduct. Were they engaged in their native districts, or in a district where they might be surrounded by friends or relatives, a powerful restraint would be placed upon them by family influences. But when these young lads ramble about at large, which they do chiefly because they have no inducement to settle down in one place, it is little more than what might be expected that they should be somewhat indifferent about their conduct. While affairs remain as at present, it need be no matter of surprise though the flow of British workmen to foreign lands should continue for some time as strong as it has been for the past few years; for, while it is impossible, even for the most enterprising and best behaved servants to acquire anything like a comfortable home or a peaceable married life, is it unnatural to suppose that they should be anxious to try their fate in another land? Leaving home is no restraint to them; the ties that unite them to their native country are weak, while they have the bright prospect held out to them of at some time attaining a position of comfort

and competence. It is not the influence of the pulpit, nor the strictest supervision that at present lies in the power of farmers, that are so much required to effect the desired end, as the *localising*, as it were, of the farm servants,—that is, affording them every facility, even inducement, to marry and settle down in certain districts. By this they would become associated with certain places and certain people, and feeling that they occupied the position of inhabitants of the district, it is not too much to expect that they would endeavour to live a quiet, happy, and respectable life. They would have a keener desire to devote strict attention to their work, while they would bring up families who, in course of time, would afford a superior supply of labour. The only means of bringing about this localising is to erect cottages all over the country, and offer special inducements to married servants. This was early recognised by the Caithness proprietors and tenants, and hence the large number of cottages in the county at the present day. Of course there are a few bothies, but these are necessary. It cannot be expected, nor is it desired, to obtain married servants for all, and therefore accommodation must be provided for the single servants. The system of putting a single ploughman to stay in a cottage with a married ploughman has been found impracticable, except in the case of relationship; and hence it has been found necessary to have a bothy on almost every farm. The bothy system, when exclusively adopted, is not by any means satisfactory; but when it exists only in the way indicated, one bothy on each large farm, nothing can be said against it. Of course, there are separate bothies for men and women. The married men are all employed by the year, while the single men and the women are engaged by the half year. Engagements are made chiefly at markets held throughout the county, the principal one being held on the Georgemas hill. As in every other item of expenditure, there has been a very large increase in servants' wages during the past twenty-five years; but still the rates are lower than in most other counties in the north. Since about 1830 they have been doubled. The ploughmen receive from L.7 to L.8 a half-year, and rations; while the women get from L.4 to L.5, besides rations. When employed by the day of ten hours, men get about 2s. 6d., and women (who are very scarce) and boys about 1s. The following is about the highest annual rate of wages for ploughmen:—

Money, . . . . .	L.16	0	0
8 bolls meal, . . . . .	8	0	0
Milk (3d. a-day), . . . . .	4	11	3
5 bolls potatoes, . . . . .	3	0	0
House and fuel, . . . . .	6	0	0

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L.37 11 3

The following is about the rate for women:—

Money, . . . . .	L.9	0	0
5 bolls meal, . . . . .	5	0	0
2 bolls potatoes, . . . . .	1	4	0
Milk ( $\frac{1}{4}$ gallon daily), . . . . .	2	10	0
House and fuel, . . . . .	0	15	0
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	L.18	9	0

SUBORDINATE INDUSTRIES.—Anything non-agricultural is beyond the scope of this essay, but I may be pardoned for introducing, in conclusion, the following few sentences on the subordinate industries of the county. First, then, we shall notice the

*Parcment Works.*—For many years the Caithness flags have been famed all over the country. They are strong, very durable, and ornamental, and are used extensively in many of the principal towns in England as well as Scotland. The demand for them in England and elsewhere was immensely increased by the very high estimate of their value given by the late Sir Roderick Murchison and other eminent authorities. A quantity of the flags are used in Caithness in thatching office-houses and fencing fields, and as divisions in byres. They suit particularly well for dividing the stalls, and are so used very extensively.

The work was originated by Mr Traill of Rattar, at Castlehill, in 1824, and the demand for the stone has ever since continued to increase. The first shipment was made in 1825, but the annual exportation for some years did not exceed 2000 tons. The Castlehill quarry, which has been under the management of Mr McBeath since its opening, has all along been the principal one in the county, and now upwards of 300 men are employed at it. A steam-engine with powerful machinery was erected some years ago for cutting and polishing the stones, thus saving an enormous amount of manual labour. The yearly average shipment from this quarry is now between 8000 and 9000 tons, the cargoes going to all the principal ports in Britain and some abroad. Mr Traill's example was followed by a number of other gentlemen, and now there are quarries of lesser or greater dimensions in almost every district of the county. Sir Tollemache Sinclair, M.P., draws a yearly rent of L.1378 for quarries on his estates; Sir Robert Anstruther, M.P., L.19, 10s. for one quarry; Colonel Guthrie of Scots Calder, L.130; Mr Sharp of Clyth, L.50; Mr Sinclair of Forss, L.492; Mrs Sinclair of Freswick, L.27, 15s.; Mr Smith of Olrick, L.50; Mr Swanson, Thurso, L.30; Sir P. Murray-Thriepland of Fingask and Toftingall, L.118; the trustees of Mr Traill of Rattar, L.1713 (for the Castlehill quarry); and Mr Williamson of Banniskirk, L.150. The total annual rent derived from quarries in the county is L.4158, 5s., and the annual value of the works

must be considerably upwards of L.30,000. The railway will no doubt stimulate the work a little, though the greater proportion of the pavement will most likely continue to be sent by sea, the rates of carriage being much cheaper.

*Fishing.*—The fishing of Caithness is of very great importance. The county town, Wick (a thriving royal burgh, with a population of between 7000 and 8000), has long been the chief seat of the herring fishery of the north-east coast. To promote and improve the herring fishery of Wick the British Fishery Society purchased the land now occupied by Pulteneytown. This neat little town is the seat of the fishery, and is separated from Wick proper by the river Wick. From July, till September all is life and bustle here, the population being at least doubled. On a fine morning, when the 3000 or 4000 fishermen that man the 700 boats of the port are landing after a successful night on the sea, the scene is animating in the extreme. Besides those engaged in the boats, a great number of men and women from the county are employed in the process of curing the fish. The fishing of Wick has been very successful all along; and while other stations have been dwindling away in importance, it still maintains its prestige. The gross annual value of the herrings exported is computed to be between L.150,000 and L.200,000, while the amount of capital invested in the trade is very large indeed. The herrings are exported to the London, Bristol, Leith, Liverpool, and Irish markets. A winter cod and herring fishing has recently been established, and is being successfully prosecuted. About 106 boats fish annually at Lybster, while Thurso, Dunbeath, and the smaller villages have a few boats. Salmon are found in the Bay of Wick.

*Trades and Manufactures.*—Tradesmen of all crafts are numerous. Besides those in the towns and villages, there are two or three shoemakers, blacksmiths, joiners, merchants, and tailors in each of the various districts throughout the county. The charges of these tradesmen have risen enormously during the past twenty-five years. Those of the blacksmith and shoemaker have risen at least 30 per cent.

There are few manufactories of any importance. There is one distillery in Wick, a large wood establishment, two or three rope works, and an iron foundry.

## ON DAIRY MANAGEMENT AS PURSUED IN GALLOWAY.

By JOHN M'CULLOCH, Agnew Crescent, Stranraer.

[*Premium—The Medium Gold Medal.*]

THE phenomena accompanying the changes in milk are well known to every person who manages a dairy, but few know that the constituent parts are only mechanically mixed. All that is required is time, and the constituent parts separate to the utmost nicety: the cream floats to the top in course of a few hours; in a little longer, according to the temperature, the caseous portion becomes sour; and, when the acidity becomes more intense, the whole mass coagulates, and in a greater lapse of time this mass separates into two parts—the one being fluid or whey, the other firmer or cheese. Raspail gives the rationale of this process as follows:—"Milk, when viewed with the microscope, is found to consist of extremely small spherical globules. On the addition of an alkali, these globules disappear, and the milk becomes transparent. On the addition of sulphuric acid, it forms a coagulum of a beautiful white colour. It is plainly seen by the microscope that this does not arise from the adhesion of the globules to each other, but that they are enveloped in a transparent albuminous membrane. Milk, then, is a watery fluid, holding in solution albumen and oil by the agency of a pure alkali or alkaline salt, and having suspended in it an immense number of globules, partly albuminous and partly oily. In accordance with their specific gravity, the albuminous fall to the bottom and the oily rise. The oily globules, however, in rising take small portions of albumen along with them; hence at the end of twenty-four hours we find on the surface of the milk a crust composed of two layers, the upper one containing more butter than milk, the under one more milk than butter. The separation takes place either with or without coming into contact with the air. The liquid part under the crust contains the dissolved albumen and oil with a portion of the sugar, the soluble salts, and a certain quantity of the albuminous and oily globules." Milk consists of water, sugar, butter, caseine, and saline matter. The analysis of ordinary milk from the cow is as follows:—

Caseine, . . .	44.8
Butter, . . .	31.3
Sugar of Milk, . . .	47.7
Saline Salts, . . .	6.
Water, . . .	870.2
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	1000.

Butter gives the richness, sugar the sweetness, caseine its thickness, water its refreshing properties as a drink, and the saline salts its peculiar flavour. The first milkings after calving, termed "beistyn," have three times more caseine than milk, only a trace

of sugar of milk, no salts, and a large proportion of a glutinous substance termed mucus. Milk boils and freezes about the same temperature as water. A high temperature induces sourness, a low one keeps it back; and at the boiling point, if not entirely sweet, it immediately curdles. The acid in milk is called lactic acid, and resembles that of vinegar. The change in milk when it becomes sour is thus described by Professor Johnstone:—"Under the influence of the caseine, the elements of a portion of the milk sugar are made to assume a new arrangement, and sour lactic acid is the result. There is no loss of matter, no new elements take part, nothing is absorbed from or given off into the air, but a simple transposition of the elements of the sugar takes place, with the new acid compound as the result." The composition of the ash of 1000 lbs. of milk has been found to be as under:—

	lbs.
Phosphate of Lime, . . . . .	3.44
Phosphate of Magnesia, . . . . .	0.64
Phosphate of Peroxide of Iron, . . . . .	0.07
Chloride of Potassium, . . . . .	1.83
Chloride of Sodium, . . . . .	0.30
Free Soda, . . . . .	0.45
	6.77

The specific gravity varies much even in the same animal, the mean of several being 1.0324, and of its whey 1.0193. Cream cannot rise through a great depth of milk. If, therefore, the cream is to be retained for some time, a deep and narrow dish is used and if it be desired to free the milk of its cream completely, it should, at not more than  $1\frac{1}{2}$  inch, be put into broad flat dishes. Cream rises in eighteen hours at a temperature of  $70^{\circ}$ —quicker if increased, slower if decreased. Cream does not consist wholly of butter, as it brings up a variable portion of caseine and milk sugar in rising. It brings up more cheese in cool weather, and forms a thicker though less rich cream. Cream of a specific gravity of 1.0244, according to Berzelius, gave—

Butter separated by agitation, . . . . .	4.5
Curd separated by coagulating the buttermilk, . . . . .	3.5
Whey, . . . . .	92.
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	100.

The constituents of skimmed milk, by the same authority, are—

Water, . . . . .	92.875
Curd (not free from Butter), . . . . .	2.8
Sugar of Milk, . . . . .	3.5
Lactic Acid and Lactate of Potash, . . . . .	0.6
Chloride of Potassium, . . . . .	1.70
Phosphate of Potash, Lime, and Magnesia, . . . . .	
and traces of Iron, . . . . .	0.55
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	100.



Butter, according to Professor Johnston, contains more or less of all the ingredients of milk, though consisting essentially of the fat, intimately mixed with a greater or less proportion of caseine and water, and a small quantity of sugar of milk. Fresh butter, according to Chevreul, contains  $\frac{4}{5}$  of pure fat, and  $\frac{1}{5}$  of those other ingredients. Only 0.5 and 0.7 respectively were obtained of cheesy matter in two samples of fresh butter made from cream and analysed by Professor Johnston; but he suggests, and we agree with him, that the percentage would be larger in "whole" milk. The proportion of butter which milk yields varies considerably: in some cases a pound of butter being obtained from eight quarts, while in others it requires fifteen. The changes produced in milk and cream to the production of butter by agitation in a churn are not well understood. It is considered that the presence of air is not necessary to the conversion of at least part of the milk into butter, as a close barrel churn produces butter as well as an open one. The formation of butter is purely a chemical process, and it is the province of the chemist to explain the sensible changes occurring during the process of churning. These changes are, the milk becoming sour, and the butter being separated in a solid form. The sourness is explained by the sugar of milk being changed into lactic acid, and this is effected simply by a new arrangement of constituents. The separation of the butter from the sour milk in a solid form, is owing to the breaking of the coverings in which the globules are enveloped, and the mutual adhesion when coming into contact. It is evident that this is a mechanical effect, but it is most likely facilitated by the action of the acid thinning away the coverings before they begin to burst. Buttermilk is the milk left after the butter has been abstracted. It is sour, and consists of butter, curd, and water. The proper temperature at which cream should be churned ranges from 55° to 63°, according to the season of the year and the heat of the atmosphere. The lower the temperature, if not increasing the labour too much, the greater the quantity and the better the quality of the butter; but no lower than 50° should be attempted, and in no part of the process should it exceed 65°. The churning of milk "as it comes from the cow" is differently conducted. The milk is cooled from six to twelve hours; and, when divested of its natural heat, the whole is emptied into a tub or vat. If the vessel is large, even a second quantity may be put in, if cooled before the former has begun to acidify. The vessel is covered over and allowed to remain undisturbed until the whole is by acidity converted into a congealed mass, or, as it is termed, "lappered." It is now ready for churning, but may remain in this state for a few days if the lapper remain unbroken. The temperature is now raised much higher than in cream—from 70° to 75°—the butter being

difficult to separate when below  $70^{\circ}$ . The time occupied in churning varies much, ranging from 20 minutes to  $2\frac{1}{2}$  hours, and sometimes there is a difficulty in getting butter even after the time is still further prolonged; this is especially the case with the milk of farrow cows and those long calved. The butter first makes its appearance in small lumps, increasing in size as the churning proceeds, more slowly than at first, until the whole is collected and then placed in a shallow wooden vessel. The butter is worked into a mass by the hands, until the buttermilk is all squeezed out. Some wash the butter in water; but when it is to be kept for a length of time, this practice is considered objectionable. If the butter is to be sold fresh, it is either put up in rolls of a pound weight, or into prints or small fancy pieces. If it is to be salted, it is thoroughly mixed with from 6 to 8 lbs. of salt to every hundredweight, and put into firkins. These should be made of clean wood, and washed with hot brine before the butter is put in. The heat of the dairy in which the butter is made should be about  $55^{\circ}$ . A spigot in the bottom of the churn, by which in warm weather the buttermilk is drawn off and cold water substituted, is one of the latest improvements.

The making of cheese was introduced into Wigtownshire with the first herds of Ayrshire cows, and at a later date into the Stewartry. Dunlop cheese has taken its name from a parish in Ayrshire, in the same way that Cheddar has from a village of that name in Somerset, and Stilton from a parish of Huntingdon. The Dunlop system still holds considerable ground in its native county, although it has had so many improvements engrafted upon it, that except by name it could scarcely be recognised. In Galloway it has given place to the Cheddar, which is characterised by more skill and exactness than the rough and ready Dunlop which preceded it. The latter will be but briefly noticed, as the former and more general method requires at our hands a pretty lengthened description.

In the Dunlop system: the heat of the morning's milk being tested, the two meals are mixed and heated to from  $78^{\circ}$  to  $82^{\circ}$ , when the colouring and steep are added. As much steep is used as will cause the milk to coagulate in thirty or forty minutes; steeping so quickly tends to keep it from souring,—one of the principles of the system,—but possibly the best reason for it is to make “assurance doubly sure.” When the curd is firm enough, it is cut at right angles with a knife until no portion is more than 4 inches square. The whey soon shows itself, when the curd is gently pressed down and the whey lifted from the top. The cutting is repeated four or five times, and the whey removed until the curd is dry enough to be lifted into a dripper with a perforated bottom. Light weight is at first put on the curd in the dripper, then after cutting into pieces about an inch square heavier weight is

used; this is repeated until dry enough for vatting, and the remainder of the process is similar to that in the Cheddar. It may be here remarked that skimmed milk cheese is made in the same way as whole milk; but the price of it being much the same as fifty years ago, is sufficient to restrict the make.

In the making of Cheddar cheese, as in all dairy operations, it is of the utmost importance that scrupulous attention be paid to cleanliness in everything inside the dairy, and not much less so that all impurities should be removed from the vicinity. The evening's milk should be placed at a good depth in fireclay coolers (which are preferable to either tin or wooden dishes), with the windows closed in cold weather; but when the range of temperature is higher, the milk should be of less depth and a full current of air freely admitted. If there is any reason for believing that the heat of the evening's milk will be more than  $66^{\circ}$  the following morning, the top of the milk should be stirred about 9 P.M., which has the effect of lowering the temperature about 2 degrees, of preventing the cream from coming to the top, and the butter from being lost in the process of making. In the morning, about 5.30, the temperature of the milk is tested, and if not considered too high, the milk may be put into the steeping tub; but if above the standard (whatever that may be), it is let stand until the morning's milk is put in. The standard here referred to can only be fixed by experience, and varies under different circumstances from  $60^{\circ}$  to  $68^{\circ}$ . It is the opinion of the writer, backed by the best authorities, that it requires to be low in low-lying, moist situations, in a warm climate, or where the land is of a mossy or clayey description; and higher as the elevation of the dairy, the exposure to drying winds, and the dry and kindly nature of the soil increases. It is necessarily higher in cold weather, in small dairies, or when the volume of milk is small in larger ones, as in those cases the milk is slower in arriving at the proper acidity. Want of knowledge in, or inattention to this particular starting point has caused many bad "kanes" of cheese, and that even by good makers—nothing being more frequent than the complaint that while they could make good cheese in one farm they could not do it in another. When the two meals are put together in the tub, the heat is raised to from  $78^{\circ}$  to  $82^{\circ}$  by a portion of milk being heated to  $120^{\circ}$ . The colouring and steep are now added, care being taken to use the quantity of steep that will make the coagulum of the proper consistency in from fifty to sixty minutes. The flavour of the steep should be pure, as, be it good or bad, it is imparted to the cheese. It may not be out of place to state here the way to make good steep. Though many substances may be used for forming curd, the calf's stomach is almost invariably taken for the purpose. It is first salted, hung, and dried. When about to be laid, the ren-

net, as it is now called, is divested of all the salt that will readily come off with the hand. Rain water is used for making the pickle, and the salt which came off the rennet is used as far as it goes. The pickle is heated to the boiling point, at which it is kept for twenty minutes, at the end of which it should, if of the proper strength, carry an egg. This pickle is now cooled for twelve hours, and one rennet added to every three quarts of pickle; the whole is then put into earthen jars from which the air is excluded, and at the end of twenty-one days will keep as long as required. If the rennets are good, two gills of the liquid will steep 150 lbs. of curd, and the same rennets, by adding fresh pickle, will still make good steep. If the curd is long in forming, the top is gently stirred down five or ten minutes before beginning to break, which keeps the cream from coming to the top. The breaking or cutting (which is preferable) is done by variously shaped instruments, the spaces between the knives or wires being about three-quarters of an inch. The breaking is done slowly at first, increasing in quickness as it proceeds. Too fast at first is apt to enrich the whey at the expense of the curd; while if the quickness is not increased the curd gets hard, is not easily broken small enough, the larger pieces are apt to retain the whey, and the cheese becomes soft and spongy. When the curd is reduced to about the size of peas, turn on the steam and heat up to from  $78^{\circ}$  to  $82^{\circ}$ , as the temperature and season of the year may direct. When at this heat, turn on cold water for five minutes; this has the effect of keeping the curd from forming a skin through which the whey could not thoroughly escape. The curd is now allowed to settle for forty minutes, after which it is broken as fine as formerly, and the heat raised to from  $98^{\circ}$  to  $102^{\circ}$ . This heat should be raised gradually, as if too suddenly, the skin spoken of previously is apt to be formed. If the use of sour whey in bringing up the acid is considered indispensable, now is the time to apply it. Some apply it along with the steep, and some partly at both times, but it is considered that the flavour is in less danger at this time, although taking double the quantity of whey to have the same effect. It is the opinion of the best makers that the less sour whey used the better, and the only way to lessen its use is to start with the evening's milk as high as possible. In very cold weather, however, it is safe enough to apply part along with the steep, or when settling down from the heat  $78^{\circ}$  to  $82^{\circ}$ . At the heat now attained care must be taken not to allow the curd to scald by setting to the bottom of the tub—the effect being the difficult escape of the whey in the press, and the after consequence, dripping in the cheese-room. Stirring is continued until the curd becomes firm, and opens out freely when pressed by the hand. If more than an hour's stirring is required, it shows that acidity has not pre-

viously been far enough advanced. If acid enough at the start, an hour will scarcely be required, and the dissipation of butter along with the whey, which not only deteriorates the quality but lessens the quantity, is prevented. A more accurate test for the proper time to stop stirring is to examine the particles of curd, which at this time present a glistening appearance; when this disappears from the last particles of a handful, then is the time to desist. Now heat the dairy to  $75^{\circ}$ , and in fifteen minutes run off the whey, for which purpose a large spigot is indispensable, as when the acid threatens coming too quickly, the quicker the whey is run off the better. When the curd appears in the raised centre of the tub, press the hand into it and lift a little of the whey; this should be acid to the taste, and nearly the same as the last run off at the spigot. If not acid enough, the run of the spigot is stopped, and it then gains very quickly. The contents of the tub require to be narrowly watched and frequently tested at this stage, as in a few minutes the curd may get too acid. It is now cut into pieces about ten inches square, and placed in a wooden cooler, where it is cut or broken into pieces not more than three inches by one, and these are turned over repeatedly until they feel firm and dry. If the weather is cool, or the quantity of curd small, this may be done in the tub, where of course it does not cool so quickly. At this stage the maker can with tolerable certainty tell the character of the coming cheese from the appearance presented by the curd. If short in texture, the curd is too sweet, and will prove a poor cheese, more or less handsome according to the length of stirring, and will not pale solid. If reedy, like cooked beef, the curd is too sour, and a tough and strong-flavoured cheese is the result; but if much too sour, it becomes a hard cheese, and of course a very poor one. If the curd peels off in thin flakes like a wafer, and of the size of a crown piece or upwards, the cheese is likely to be good.

The best cheese is made with a high heat at starting, a low one at steeping, and by keeping as near going too far with acidity as is practicable. The produce of this latter make is rich in quality, and is soon ready for the market; but if it is desirable to keep the cheese over year, the make requires to be sweeter. It may be here remarked, that if the cows are heated by over driving, the milk gains acidity more quickly. When the milk is affected by electricity, more steep is used to hurry on the process, and when rising to  $100^{\circ}$ , the whey is drawn off to near the curd, and replaced by about 15 to 20 gallons of water, and a pound of salt for every 100 lbs. of curd;—this will prevent a bad cheese from being made, but still the flavour will not be fine. The curd is now spread, milled, and mixed with one pound of salt for every 56 of curd. Part of the salt is some-

times put in before milling, and the rest afterwards. This is only done when there is a fear of being too acid, the salt exercising the influence of delaying the acidity. When at  $67^{\circ}$  the curd is put into the vat, light weight is at first put on, in the evening a dry cloth is given, the other end is turned downwards in the vat, and on being put into the press more weight is added. When vatted too warm, the butter partially escapes along with the whey; when too cold, the whey is not all extracted. When the make is acid, and the curd put in too warm, the cheese becomes a whitish or speckled colour, which is best detected by paling a ripe cheese about  $1\frac{1}{2}$  inch from the edge in a downward direction. In the morning the cheese is put into water heated to  $120^{\circ}$ , for about four minutes; this scalding gives a nice smooth appearance, and if neglected, the cheese from the inequalities of the first cloth, will either have cavities inside or irregularities outside. The scalding is repeated at night, and in the morning fine calico is put on the ends to sound them as it is called, and after being twenty-four hours in the press the cheese is bound with cotton to keep it in shape, numbered, dated, and laid on the shelf of the cheese-room. Turning is required daily for the first two months, and the cheeses are ready for the market in from three to five, according to the acidity and firmness of the make. The ends of the cheese on being put to the cheese-room are rubbed with butter, which prevents chipping, and improves the appearance. The cheese-room is in winter, by means of steam or hot water, kept at a temperature of about  $65^{\circ}$ : if much below this, the cheese becomes soft and mouldy; if much above, the flavour gets stronger, and the texture less close. The ceiling should be stuffed behind with some non-conductor of heat, such as sawdust, to prevent the room being too hot in summer; the admission of air, and not too much in one place, should be carefully studied, and ventilators at the top provided, whereby the heated and foul air may escape. This method, being the one advocated by the writer, has been more fully treated of. In the others to follow, as in the preceding one, the variations only will be noticed.

Without the aid of steam there is no difference until the sour whey is put in along with the steep. The time occupied in stirring is much the same, but about half an hour before it is completed a small quantity of whey is drawn off, and heated to  $120^{\circ}$ . This when returned raises the heat to from  $82^{\circ}$  to  $84^{\circ}$ , and in cold weather stirring is kept up for fifteen minutes, so that the particles of curd may not readily adhere to each other. The curd is now allowed to settle for ten minutes, and a larger quantity of whey is drawn off, and heated to  $150^{\circ}$ ; the remaining whey is drawn off until the curd shows itself, when the heated whey is returned. It is gently showered on the mass, a

lively stir is kept up, and at the end of ten or fifteen minutes the temperature will be about  $100^{\circ}$ . This heat is kept up, and the stirring continued—more gently, however—until the curd attains that elastic feel described in the previous process. The curd is now allowed to settle for from five to twenty minutes, according to the acidity, and the remaining whey is drawn off. The curd is now cut into pieces about 9 inches square, which are turned on to each other, and covered over with a thick cloth. At the end of half an hour the curd is again cut into squares, and the inside and outside ones reversed, and in another half hour it is split on the cooler and cooled to  $70^{\circ}$ . The remaining part proceeds as in the steam-aided Cheddar.

In the Canadian system, the first alteration is that of putting in along with the steep more sour whey than in any other method. The stirring proceeds, as in the steam-aided Cheddar, until the curd is dry enough, when instead of being allowed to settle, the whey is drawn off, and the curd in its divided state is put into a cooler with a cloth between it and the perforated bottom. This sudden removal from the tub accounts for the extra whey put in at first, for the purpose of bringing up the acidity. The remainder of the whey escapes from the cooler, and the particles of curd are kept from going together by being frequently wrought with the hands. The necessary acidity is in this way attained in three or four hours, when the curd is vatted, after which there is no difference from the other methods.

Of the four systems here described, the two Cheddars undoubtedly hold the highest place, it being a matter of opinion which of these is best, as at the shows of dairy produce neither can as yet claim a decided preference. The steam-aided has the disadvantage of being less practised, and requiring more skill on the part of the maker, but we are of opinion that the best and most regular dairies could be made by this method. The Canadian system is so called from being introduced by a gentleman from Canada, who was taking agricultural notes at a farm near Stranraer. It is little practised, and its further adoption is far from likely. The appearance of the cheese is rather beyond the Cheddars, but any that the writer has seen are deficient in richness. They are firm, dry, ripen early, and consequently are rather poor; but those with whom they are in favour urge that, with less stirring and lower heats, the quality may be improved. We may here remark, that the credit of making the first really good cheese in Galloway belongs to a dairyman, who when near Newton-Stewart imitated the Cheshire and double Gloucester, until his cheese became famous in Edinburgh and other leading markets. Previous to this (about thirty-five years ago) Galloway cheese was only reckoned second and third class by the dealers. After a time the Cheddar method became the study of him and

his younger brothers, and to them, and them alone, notwithstanding much writing to the contrary, can with justice be ascribed the introduction of the Cheddar system. There is also no question that good Cheddars were made in several places in Wigtownshire before the far-famed Ayrshire deputation visited Somerset in 1854. Some improvements have been adopted through different farmers noting them in the south, still the dairy farmers of these two counties can now boast that in no district of Great Britain can as many good and as few bad cheeses be produced. A challenge to show against Somerset, some five years ago, for L.200 a side, was not accepted, and the opinion among unbiassed judges was that the great bulk of the prizes would have gone to the northern competitors. The heating of the cheese-room and the bottom of the tub with steam, was the invention of a dairy farmer of the Rhins of Wigtownshire, who has done otherwise a great deal to improve dairy husbandry. Though the dairies of the Stewartry figure high in the prize lists, yet they are not nearly so numerous as those of Wigtownshire.

The dairy herds of cows are almost all of the Ayrshire breed, and the number in each ranges from 20 to 100. Some farmers possess 150 or even 200 in different dairies, but 100 is the maximum it is considered expedient to herd together. In the vicinity of towns and villages the number is sometimes less than 20, but there the milk is either sold new or converted into butter. In the management of dairies, three different modes are adopted:—First, The management is entirely in the hands of the farmer, and the feeding of the cows and pigs, and the making of the cheese, is conducted either by a member of the family or by a dairymaid hired for the purpose. Second, The farmer contracts with a party who is considered capable of taking the full management, for which a certain sum per cow is paid, and which, including all perquisites, amounts to from L.1, 5s. to L.1, 15s. A percentage is also sometimes given on the stones of cheese above a certain yield, or on the profits of the pigs—thus, to a certain extent, making the interests identical. Thirdly, and which is the most general practice in the large dairies, is to let the produce of the cows to a dairyman or “Bower,” who takes the entire management, under certain conditions, at a fixed rent in money or in cheese. The let is usually for one year, the entry at Martinmas, and the rent varies from L.9 to L.13. 10s, in money, and from 17 to 20 stones, of 24 lbs. each, in cheese. For winter feeding, 3 to 5 tons of turnips, 20 to 36 lbs. of bran, and from 10 to 20 stones bean-meal, along with the run of the fodder, are allowed to each cow; in summer, 1½ to 2 acres of grass to each, and an acre of cut grass or vetches to every 15, and in autumn one acre of cabbage or turnips to every 15 or 20. The dairyman



prepares and carts the summer and autumn food, getting one of the farmer's horses to cart it; but the winter food, the pigs, and cheese are usually carted by the farmer's men and horses. If the dairyman is allowed to keep a horse, then the farmer's carting is limited to that which could not be overtaken by one horse. The dairyman has a free house and garden, a quantity of potatoes set, and in the case of the larger dairies has the farmer bound to supply a certain number of milkers from the farm-house and the houses of his yearly men. The deductions allowed are—for late calving, one shilling per day after 15th May; for queys instead of cows, for farrow ones and those which have picked calf, from one-fifth to one-fourth of the rent. The bringing up of calves is met by a deduction of 100 lbs. of cheese for each calf, or an equivalent in money, and the clause "that all disputes shall be settled by arbitration" is found in most written agreements on the subject. The security for payment is not often of the best description, although, as a rule, the rents are well paid. The farmer, though parting with the control of his stock and produce to the extent of several years' rent, has not the power of hypothec over the dairyman that the landlord has over his tenant. This method, although relieving the farmer from the care and anxiety he would otherwise have, takes the control of the cows and their feeding almost entirely out of his hands. In some seasons, the grass when too plentiful is wasted; and in others, such as that of 1868, extra feeding in some way or other becomes imperative. The drafting of the old and farrow ones, the bad milkers and those that have cast calf, is done all through the winter and spring as circumstances suggest. Their places in like manner filled either by queys reared on the farm, or by queys or cows bought from the breeders, or at the auction sales now so common throughout Galloway. The cows are first put to grass from 1st April to the 20th May, as the house-feeding and the earliness of the grass may dictate. The cows are housed at night during the first week or two after going to grass, after which they are scarcely ever in, except for milking, until cold weather begins to set in, about the beginning of October. The bull is put to the cows early in May, and one is allowed for from 30 to 50. Early calving is conducive to a large and profitable yield, as the cow is a poor one which does not more than double in produce the increased cost of feeding; and it has with truth been remarked that a cow calved on the grass fails almost as quickly in autumn as one calved in February or March. The milking is done by those engaged in the dairy, supplemented by the girls of the farm-house and the women workers of the farm. The latter receive 1s. 6d. to 2s. 6d. per week, and although they lose an hour in the fields, no deduction from their wages follows. The person who takes charge of the dairy tests the milking by "strip-

ping," that is, taking what the milkers leave, which should be very little; and if the dairy is only of moderate size, this person also carries the milk. The milking begins at six o'clock morning and evening, and each milker is expected to milk 10 cows in one hour to one hour and a half. The milking is a very important operation, on which the quantity of produce greatly depends, and should be well and quickly performed, and with all practicable ease to the cow. Slow, bad milking may easily diminish the yield by 10 to 20 per cent. Milking machines have been tried, but being defective in many ways their use has been entirely given up. A few words may be said on the great drawback to dairy farming, known as abortion or "slipping calf." It is very common among dairy cows; the percentage varies much, and it has been said to be infectious. Although it is considered by a great many authorities that no cause can well be given, the experience of the writer has led him to suppose that there are many causes. Cows drinking water off ironstone, or out of ponds whose tributaries are impregnated with impurities from the steading, are more apt to cast calf than those drinking off limestone, granite, or greywacke, or from a pure pond. But perhaps the most frequent cause is improper feeding at a certain stage of pregnancy. As pregnancy advances, the manufacture and supply of blood are of the utmost importance, and nature calls for increased nourishment and less waste of body in producing milk. But the practice of giving a large quantity of unripe turnips with the tops upon them, unnaturally protracts the milking season, and from the demands of nature on the constitution the animal loses flesh, and the evil complained of follows. It most frequently happens in the third, fourth, and seventh months of pregnancy, and if the cow is a good one which casts calf at the latter stage, she is retained in the stock. We think that by giving the turnips at three times, instead of twice a day, or giving a more concentrated food, the evil would be lessened. It is almost certain, too, that when the milking powers are strained in autumn, such a course will be met by a more than corresponding decrease when the cow calves in the following spring.

#### ON A NEW SYSTEM OF WIRE FENCING.

By THOMAS OGILVY of Corrimony, Inverness-shire.

[*Premium—The Medium Gold Medal.*]

THE idea of this fence was given to a friend\* about five years ago by a gentleman from Australia, who had seen something of the kind in New Zealand on his way home to this country. He gave no details beyond the fact that the standards were placed

\* James Stuart Tytler, Esq. of Woodhouselee.

at much greater distances apart than usual in this country, and that such effect was thereby given to the elasticity of the wire that when the fence was charged by wild cattle, they were thrown so violently backwards as in some instances to come to the ground with all four legs in the air. There was a striking confirmation of this in the case of a stampede of a large troop of wild mares against a fence of similar construction in the River Plate—the elasticity of which was very great, owing to the uninterrupted stretch of the wire being upwards of 200 yards. On this occasion ten or twelve of the animals were literally hurled backwards by the recoil of the fence, and thrown to the ground half stunned by the shock. It may be added, that the nature of the climate and soil in the River Plate is such as to occasion extreme difficulty in the formation of a thoroughly stable and permanent wire fence, and nothing really satisfactory was ever erected there until the new system was introduced; and the consideration and varied experiments necessary to overcome the difficulties met with in doing this have been found useful in carrying out the details of the system here.

Any attempt to obtain further particulars at the time from the Australian gentleman above referred to was defeated by his immediately afterwards leaving the country, but by information recently received from an Australian merchant and stockowner, it appears that the system of fencing there differs in many essential points from that of the Corrimony fence. Up to the present time, the standards in New Zealand are only 11 yards apart, instead of from 17 to 25; the wire is wedged at each standard, instead of running in an uninterrupted stretch from strainer to resisting post, a distance twenty fold greater, by which the elasticity of the fence is greatly increased; and there are no droppers, the use of which is considered to form the most important distinguishing feature of the new fence.

Simultaneously with the first report on the New Zealand fences, the use of Bessemer steel wire for fencing purposes came to the knowledge of the writer. It was first thus applied by the late Mr William Bain, then principal of the firm of W. Bain & Co., and was found to possess an extraordinary degree of tenacity, or high breaking strain. It was at first, however, only annealed, and when tried at the cattle farm in the River Plate above referred to, was found to be practically useless from the manner in which it stretched. Upon this, the writer pressed upon Mr Bain the absolute necessity that the wire should be rendered "bright" or tempered, otherwise the invention would be of no value for fencing purposes. Mr Bain doubted the possibility of doing so, but upon this representation he made the attempt, and succeeded completely without having to raise the cost.

On a trial at Corrimony, where two lengths of 14 yards each of No. 12 bright and annealed steel wire respectively were compared by knotting them together, and submitting them to an increasing strain, the latter broke; and, when measured, was found to have stretched to the extent of 37 inches, and in fact to have been drawn out to a considerably higher number by the wire gauge, while the bright steel wire had not increased perceptibly in length. This characteristic it retains in fences that have been erected about four years, and have been constantly kept at a high pitch of tension; and, contrary to what might be expected, no trouble has been occasioned by the hardness of the wire in putting up the fence, scarcely a single breakage having occurred in knotting some 50 or 60 miles of wire.

In this essential quality of elasticity no wire with which I am acquainted at all equals that made by Messrs W. Bain & Co. The thickest wire used in the Corrimony fence is No. 8, which has been found sufficient to keep in Highland cattle. When this wire was first placed in the hands of men who had been employed for a good many years in erecting wire fences here, they were so sceptical as to its being sufficiently strong, that, to remove their doubts, the No. 8 steel wire was repeatedly knotted to, and strained against the best No. 4 bright wire of the kind previously in general use, and in every instance the No. 4 parted, and that elsewhere than at a knot.

By the tables of the respective manufacturers the strength of steel wire is stated to exceed that of the old bright wire by about five numbers of the wire gauge, as in the above instance where No. 8 broke No. 4. There is, therefore, a saving in a steel wire fence equal in strength to the old bright wire of 60 per cent. in weight; which, though the price per ton was 50 per cent. higher in 1869, left a saving in cost of no less than 40 per cent.

Another mode of staying terminal posts, or those where the line of fence forms an angle, is by sinking a wooden block at right angles to the line of strain at the distance of a few feet behind the post, and putting round it a double back-stay of strong wire. The method of fixing the posts and standards was arrived at after a variety of experiments, both in the River Plate and on this property. The winding-posts in use when trial operations were first begun were elaborate, costing from 31s. 6d. to 38s., but attention being turned, both here and in the River Plate, to the formation of the ratchets, led to the improvement not only of these, but also of the winding-posts; the old cast-iron toothed ratchet or cog-wheel being replaced by a disc of rolled iron attached to the end of the barrel of the winder, working between two wrought-iron cheeks, regulated in the simplest way by a pin inserted through corresponding holes in the disc and cheeks, as shown in the diagram, and admitting

of the easiest and most minute alteration in the tension of the wire. The improved solid bar winding-posts with ratchets complete, the idea of which was borrowed from a fence in the grounds of a neighbouring proprietor, are now to be had for 13s. 6d. each, or a saving of about 60 per cent. on the original cost.

Another mode adopted here, less compact than the simple iron winding-post, but perhaps even cheaper still, was by placing two angle irons opposite each other with a square centre or core of oak or other hardwood, and binding them together by wedging the cheeks of the ratchets. By adopting the description of ratchet exhibited at the Inverness Highland Society Show in 1874, under the name of the "Glen Urquhart Winding Post," either the solid winding pillar or the composite one may have the ratchets altered to suit varying heights or divisions of the wires of the fences, but this can be of very small practical importance.

Where the standards require to be placed in rock, they can be quite securely fixed with sulphur and sand, in a hole bored a few inches deep.

The only thing that remains to be added is with respect to supplying the place of droppers that may be broken, or increasing their number in the fence. For these purposes the droppers should be sawn out rather broader than usual, and the holes bored out quite in the centre, slits to admit the wires being cut slanting upwards to the holes through the narrower side of the dropper; which, when hooked on to the wires, can easily be fixed in its place by a lashing of thin galvanised annealed wire, passed round the fence wire and the broader side of the dropper, and fastened off by a twist with a pair of pincers.

The fence was first erected at Corrimony, in 1873, over an exceedingly irregular line, where in some parts rock was continually cropping up near the surface, while in other places there was nothing but soft moss afforded for a foundation. Notwithstanding the disadvantages of such a situation, the fence has proved itself to be a thoroughly efficient enclosure, and its success has been attracting considerable attention among the neighbouring proprietors and agriculturists. It may merely be mentioned that there are now upwards of 20 miles of the fencing in the district. The construction of the fence is of rather a novel character, and with the view of better explaining and illustrating it, a set of drawings have been prepared showing the various parts in detail.

No. 1 is an elevation of the fence on ordinary level ground, and is intended to represent a line one mile in length. The pillars A A A A and B B B B B divide it into eight equal parts, each measuring 220 yards. The pillars are designed to keep the wires at full stretch, those marked A being provided with an apparatus, by means of which each wire can be tight-

ened and its tension regulated. They are distinguished by the name of *winding pillars*, from the others marked B, which are termed *resisting posts*. These pillars or posts are disposed along the line of fence, first one kind and then the other alternately. It will be seen that three of these resisting posts stand between winding pillars, so that the strain of the wires, which is exerted on one side of them, is balanced by an equal strain on the other. But the two remaining posts, which are situated at the extremities of the fence, have the pull of the wires acting only on one side, and as a natural result there is a tendency for each to be drawn off the perpendicular. Consequently, for the purpose of preventing them from being moved from their vertical position, stays are attached to them, and these stays are of two kinds, as shown at the respective ends of the fence. That on the left hand consists simply of a few plies of the fencing wire, tied to a large wooden block (or it may be a stone), buried in the ground behind the pillar, and the earth rammed firmly down on it. That on the right hand is a rigid stay of iron, also secured to a wooden block below ground, but is set against the pillar on the side on which the strain acts. In the first of these plans the pillar cannot yield without drawing out of the ground the large block at the back of it; and in the second method, before the pillar could incline, it would require to force the block attached to the iron stay down through the solid earth. Both contrivances are equally effective in counteracting the strain of the wires, and either mode can be adopted as is found to be more convenient and suitable to the peculiarities of the line of fence. All the pillars, both winding and resisting, have underground wooden blocks, as shown in the diagram, but in addition they have a lateral stay (that is, one that is fixed at right angles to the line of fence), to prevent them from yielding to any force which may be brought to bear upon the fence in a side direction.

Fig. 4 is an end view of one of the winding posts A, showing the lateral stay, which is of round iron and fixed below ground to a wood block. In some situations it may be necessary to have another stay fixed on the opposite side of the pillar, but when two such stays are required they may be made of wire.

In connection with the winding pillar, attention has to be drawn to fig. 5, which displays on a larger scale the apparatus for tightening the wires. It consists simply of two small plates of iron, which are riveted on each side of the pillar parallel to one another; and working between them are two revolving barrels, on which the wire is wound. The barrels project through the plates on each side, and at one end are prepared for receiving a wrench, by means of which they are turned. The other end has a circular flange in which there are five holes, and two corresponding holes are placed in the plate in the same radius, so

that as the barrel is wound the holes in each meet ten times in one turn of the barrel. When the wires have been sufficiently strained (or if need be slackened), a stopper is inserted, through whichever holes are opposite each other, and the barrel is thereby prevented from turning back.

Fig. 6 shows a similar straining apparatus, adapted for attaching to wooden posts. The two winders are separate, but have a connecting bolt which passes through the post and secures them to it at the same time by a key or screw nut.

No. 2 exhibits another elevation of the fence, representing one of the divisions in the previous diagram subdivided into ten stretches by the standards marked C. The uprights, A and B, at either extremity, show a winding and resisting post respectively, standing at the distance of 220 yards apart, consequently the ten subdivisions will measure 22 yards each. The standards C are made of angle iron section, thus:  $\Gamma$  They are fixed to wood blocks underground, as in the case of the pillars, and have likewise lateral stays.

Fig. 7 displays an end view of one of these angle iron standards, showing the lateral stay with underground block, similar to those attached to the pillars.

No. 3 represents one of the subdivisions in diagram No. 2; the uprights C C at the extremities being two of the angle iron standards. No further support is afforded to the wires between these uprights; but, to prevent them from being pressed apart, flat pieces of wood, termed "droppers," are wedged to them, 7 feet 4 inches apart. This distance, however, may be altered according to circumstances. The droppers marked D do no more than touch the ground, and are free to move over the surface on receiving any pressure. Their introduction enables the actual supports for the wires to be reduced to a minimum; and this it is which constitutes the distinguishing feature of the Corrimony fence. The advantages arising from this mode of construction may be estimated as follows:—

*First*, there is a direct saving in the cost of the materials consequent on only about a tenth of the usual number of uprights having to be provided. Of course the wooden droppers require to be taken into account; but their expense is very trifling.

*Secondly*, a saving in labour is effected, there being only one standard to fix in 22 yards instead of 9 or 10, as would be the case in an ordinary fence.

*Thirdly*, there being so small a number of iron uprights there is a great decrease in weight, and, consequently, a proportionate saving in cartage, which often is a considerable item in the cost of a fence.

From what has been said respecting the construction of the fences it will be apparent that the success of the principle

must in a great degree depend upon the uniform strength and soundness of the wire, and attention is invited to a new description which has been introduced for this fencing. Unlike the wire in ordinary use it is not drawn from iron, but from Bessemer steel; and, prepared from this material, the wire possesses in the highest degree the properties of elasticity and tenacity which are so essential to the efficiency of strained fencing. Its tensile strength may, in general terms, be compared with that of ordinary wire, as follows:—

No. 8 steel	equal to	No. 4 iron wire.
No. 9 do.	"	No. 5 " "
No. 10 do.	"	No. 6 " " and so on.

The relative sizes of steel equal in strength to iron wire being four numbers smaller. In consequence of this superior strength of the steel wire it is unnecessary to use sizes so heavy as are commonly adopted in the case of iron wire. No. 7 to Nos. 11 or 12 steel will make perfectly secure fences for cattle and sheep. Combined with the advantage of light sizes, which are easily handled, the wire is drawn in very long lengths, so that few ties require to be made. These little peculiarities all tend to promote the facility of erecting the fence.

The specification of the materials adopted in the fence at Corrimony is as follows:—there are six horizontal bars of steel wire, the top one being No. 10, the bottom No. 11, and the four intermediate ones No. 12, arranged thus:—

Top bar	3 feet 3 inches	above ground.
Second do.	2 feet 6	" "
Third do.	1 foot 10½	" "
Fourth do.	1 foot 4½	" "
Fifth do.	0 feet 11	" "
Sixth do.	0 feet 6	" "

The pillars, both winding and resisting, are of solid malleable iron, 1½ inches square and 6 feet long, so as to allow of their being sunk 2 feet 9 inches into the ground. The lateral stays are made of ¾-inch diameter round iron. The standards, as already stated, are of angle iron, 1½ inches by 1½ inches, and their length is 5 feet 9 inches. The lateral stays for them are of wrought iron, ½-inch square. The droppers should be of oak or ash if possible, 2½ inches broad by ¾-inch thick and 3 feet 2 inches long, or they may be of larch, 2½ inches by ¾-inch. The wooden blocks do not require to be of any particular dimensions, nor dressed in any way; but those for the standards should not be less than 16 inches long by 4 inches in diameter; and for the pillars they should be at least 20 inches by 5 inches.

The various materials having now been enumerated, a few words may be said in regard to fixing them, and to show how the whole fence may be most expeditiously erected. The line being



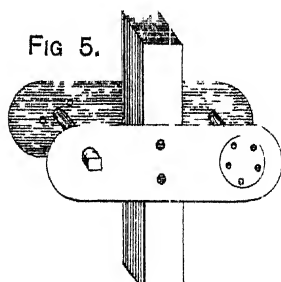
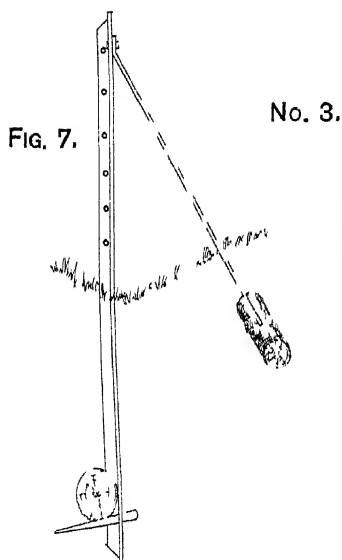
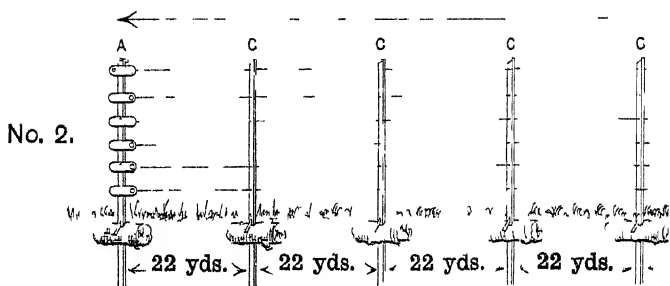
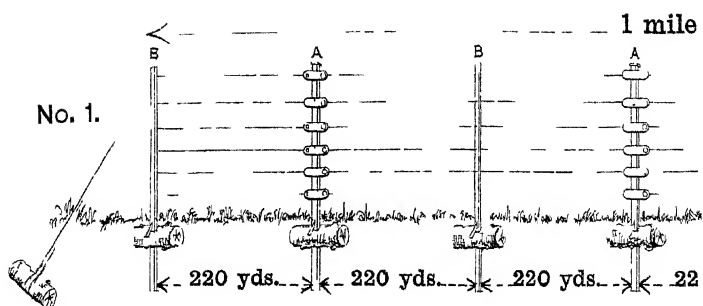
staked off, operations are commenced by setting the pillars and standards into the ground at the distances before specified, or as near thereto as possible. This part of the work can be performed very quickly in the following manner:—

Drive the pillar or standard with a hammer into the ground, until it is at the required height above the surface; then open a hole close to the side to admit the wooden block, and insert the iron pin in the upright which is prepared for it. This pin rests on the block, and prevents the pillar from sinking. The hole may then be filled in. On the side of the pillar, opposite to that on which the wooden block is placed, the lateral stay is fixed, but before being put into the ground a wooden block is attached to it. The stay is made small at the extremity, so as to pass through a hole in the block. It is inserted to the extent of 6 inches, where a shoulder on the stay prevents it from penetrating further; and the part projecting on the other side is bent over the block, and the two are thus fastened to each other. A hole being made in the ground, about 2 feet from the side of the upright, the block is placed in it, and the top end of the stay secured to the pillar with a bolt and nut. The earth being rammed in over the block, the fixing of both upright and stay is completed, and all the others in the line can be set up in the same manner in succession. When a pillar or standard has to be placed in a hollow, there is a tendency for it to be raised out of the ground, in consequence of the strain of the wires on each side inclining upwards. To prevent this the wood block is placed near the bottom of the upright, with the iron pin below it. The weight of the block, with the earth rammed over it, keeps the upright down. Another mode of staying the terminal posts, or those where the line forms an angle, is by sinking a wooden block at right angles with the line of strain at the distance of a few feet behind the post, and putting round it a double back stay of strong wire.

Fig. 7 represents one of the standards C in a hollow, showing the pin fixed below the wooden block. The standards and pillars being set up, the next thing to be done is to run in the top wire, and as each upright is passed, eight of the droppers should be slipped on. When the wire is stretched from one pillar to another, it may be tightened up by the winding apparatus, and the droppers arranged and wedged in at the proper distances apart. The next wire put through should be the bottom one, to which, after it has been strained, the droppers should also be wedged. The intermediate wires after this can be run through the uprights and droppers without difficulty, and when strained up, the portion of fence between these two pillars will be completed. It has been found better not to wedge the wires to the angle iron standards, but to allow the elasticity of the wire to act the whole way, from one pillar to another. Under particular circumstances they may,



# “THE CORRIMO



# ONY WIRE FENCE."

equal to 1760 yards.

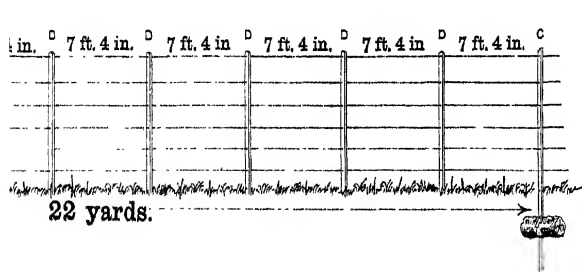
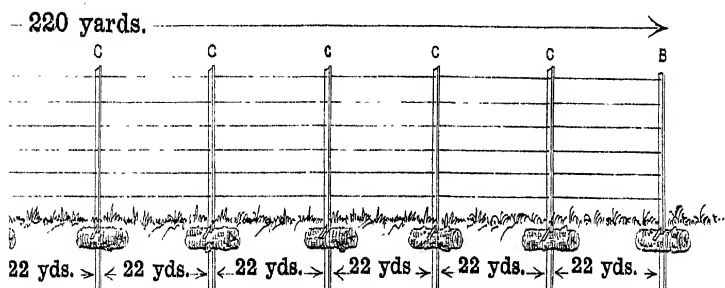
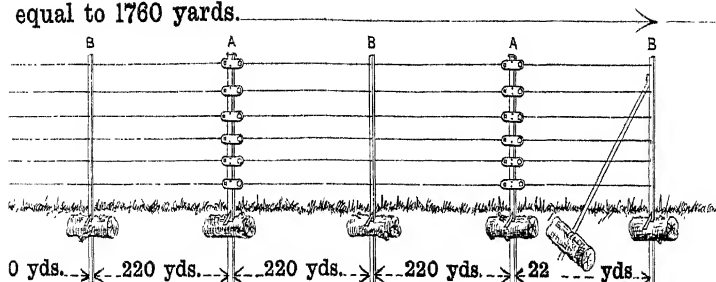


FIG. 6.

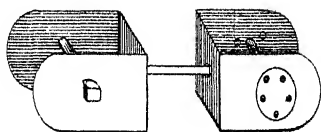
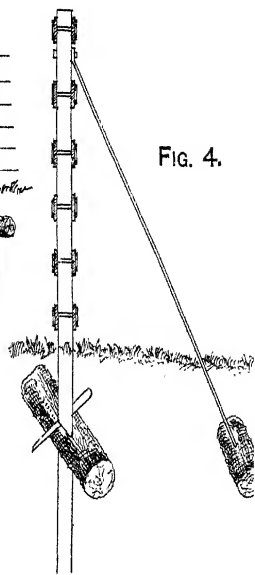


FIG. 4.







The following is a detailed estimate of the cost of the wire and iron materials required for a mile of fence, as has been specified in the foregoing:—

1 Mile No. 10 Steel Wire,	at 62/	L.3	2	0
1 Mile No. 11 do.	at 50/9	2	10	9
4 Miles No. 12 do.	at 43/6	8	14	0
4 Winding Pillars, .	at 13/9	2	15	0
5 Resisting Pillars, .	at 5/3	1	6	3
9 Lateral Stays, . . .	at 1/9	0	15	9
2 Stays for End Pillars,	at 4/	0	8	0
72 Angle Iron Standards,	at 1/5½	5	5	0
72 Lateral Stays for do.	at 9d.	2	14	0

It is generally advantageous to procure the droppers and wooden blocks for the uprights at the nearest wood-yard in the locality where the fence is being erected, and the cost of what is required for a mile should not exceed L.8. Where the thinnings of plantations are obtainable, and a saw-mill handy, the wooden materials for a mile should not cost much above L.5.

1st, The Expense of the Iron Materials,	.	.	.	L.27	10	9
2d, " " Wood " "	.	.	.	8	0	0
3d, " " Erection, " "	.	.	.	10	0	0

No other description of fence, possessing the same strength and efficiency, can be put up at so small an outlay. One superior property of the fence is its elasticity, by which it yields to any force which may be brought to bear upon it—such as by cattle or sheep charging or rubbing against it. The moment the shock of pressure is removed it springs back and resumes its former position, without being in the least degree injured or deranged. The merits of this system of fencing may be briefly described as—thorough efficiency, cheapness, and durability; and, an important feature which distinguishes it from all other fences, namely, the facility with which any extent can be erected in a short time, particularly over bogs, mosses, &c. There are in the Highlands, Borders, &c., large tracts of such land, which have no enclosure or divisions at all, at least of an adequate nature, and for these situations this fence is admirably adapted.

## ON STATE FORESTS AND FOREST MANAGEMENT IN GERMANY.

By Captain CAMPBELL WALKER, Deputy-Conservator of Forests, Madras.

[*Premium—The Medium Gold Medal.*]

[THE fact that young men nominated for the Indian Forest Service have for some years been sent abroad to acquire a knowledge of the French and German systems of forest management, before entering on their duties in the East, has caused attention to be directed to the organised operations carried on in the State forests of the Continent.

The system adopted in France was detailed in the prize essay of Mr J. Sykes Gamble, "On the State Forests and Forest Schools of France" (Transactions Highland Society, 1872, p. 240). The methodical way of treating the forests, practised in Germany, is fully described in Captain C. Walker's report, to which the judges awarded a medium gold medal. We believe that many of our members will welcome information on this subject—new to our Transactions. The report, along with others on kindred topics, has been printed by order of Her Majesty's Secretary of State for India,\* in a small octavo volume. In Dr Brandis' preface to this volume we read that it may seem strange "to expect forest officers from India to profit by studying forestry in Europe under a climate totally different, and in forests composed of other kinds of trees; but actual experience has shown that the professional knowledge acquired in European forests is of great practical use in India. There is hardly a question or difficulty of importance which arises in connection with forest administration in India, whether in regard to forest rights, or the working or the regeneration and improvement of the forests, which has not been dealt with practically over and over again by foresters in Europe."

Captain Walker's tour of inspection lasted four and a half months, nine weeks being spent in Hanover, and the remainder in visiting the forests of Saxony, Bavaria, Baden, and Austria, acquiring a knowledge of their extent, situation, and yield, the general plan of management and administration, and the strength and duties of the establishment employed. Much of Captain Walker's report relates to the Hanoverian forests, and the system and operations in these may be considered typical of the whole of Germany; and it is admitted that they are well managed

‡ \* Reports on Forest Management in Germany, Austria, and Great Britain, by Captain Campbell Walker, F.R.G.S., Staff Corps, Deputy-Conservator of Forests, Madras; with extracts from reports by Mr Gustav Mann, Mr Ross, and Mr T. W. Welber; and a Memorandum by D. Brandis, Ph.D., Inspector-General of Forests to the Government of India, on the Professional Studies of Forest Officers on Leave. W. H. Allen & Co., London. 1873.



under the supervision of Forest Director Burckhardt. A great deal of useful and valuable information is given; the working of the German system being minutely detailed. There is a succinct statement of the area, classification, yield, receipts and disbursements, and the establishment maintained in each forest visited. Natural production and planting are fully explained.

Captain Walker also describes certain peculiarities of management carried out in the Black Forest, and gives an interesting account of floating the timber.

In the interesting chapter entitled "General Remarks," Captain Walker states it as his opinion that we are as far behind Germany in the knowledge and application of scientific forestry, as we are in advance of her with regard to agricultural pursuits.

Although the author acknowledges that there is no necessity for large forests in this country, yet he urges that the opposite is the case in India, and proceeds to show how the German system, modified according to circumstances, would be suitable for that country, and certain points in which it might prove useful as a model are brought forward.

Captain Walker devotes the close of his report to "Suggestions to forest officers visiting Germany," which would doubtless prove of great utility to those about to do so; a specimen is appended of "Headings into which the sketch of working plan may be divided."]

#### HANOVER.

The forests of Hanover under State management extend over an area of 1,435,329 Prussian *morgen*, equal to upwards of 900,000 English acres. (The Prussian *morgen* is  $\cdot 63093$  of the English acre, the old Hanoverian *morgen* being  $\cdot 6477$  of the English acre.) This extent is classed as—

- a. 937,673 *morgen* government forest (591,000 English acres).
- b. 53,806 *morgen* ecclesiastical or "Kloster" forests now secularised (34,000 English acres).
- c. 261,116 *morgen* communal forests (165,000 English acres).
- d. 182,734 *morgen* government moors and peat mosses (115,000 English acres).

The forests under class *a* are entirely the property of the State, although burdened in many cases with communal or individual rights and servitudes; those under *b* were formerly church property, now secularised by Act, and are managed by the forest department on behalf of the special department or board appointed for their administration. The profits are mainly devoted to educational and charitable purposes.

Class *c* are communal forests under Government management in accordance with the provisions of an Act which provides that they shall be managed entirely by the government officers, but

that the surplus annual yield of wood shall be entirely the property of the community, to devote to their own purposes or sell as they may think best. The community pay one groschen ( $1\frac{1}{2}$ d.) per morgen towards the pay of the officers in charge, unless the forest is of sufficient extent to justify the employment of a special officer, in which case they are debited with the total amount of his pay and allowances, as well as with the disbursements for subordinate establishments and working charges.

Under class *d* are included extensive waste tracts, which in many cases are now being gradually planted with Scotch fir, and a considerable area of peat-bog or moss.

The annual yield of the forests during the four years from 1859 to 1863 inclusive was nearly 45 millions of cubic feet (of which about 10 millions of cubic feet were handed over to persons having rights and privileges), representing an average yield per morgen of the cultivable area of about 37, and of the area actually covered with forest of 40 cubic feet per annum.

In the tables from which this information is taken the average yield of the hill forests is shown as much higher than that of those in the plains, the former yielding from 52 to 64 cubic feet per morgen, whilst the latter did not average more than 30.

Director Burckhardt gives me the annual receipts from the government forests at two millions of thalers, or L.300,000, whilst the annual disbursements during the years 1859 to 1863 amounted to thalers 455,138 for working charges, and thalers 390,688 for establishments, pensions, land-tax, &c., making a total of thalers 846,426, say L.128,000, and a nett surplus revenue of L.162,000.

These figures must not, however, be taken as perfectly accurate. The fullest information is given in Burckhardt's "*Forstliche Verhältnisse des Königreichs Hannover*" (published in 1864), section VIII. pp. 69 to 99; but, as there pointed out, it is difficult to separate some of the charges, as the Harz Forests were until recently worked separately, and payments on account of mines, post roads, &c., included in the forest budgets, whilst the contributions of communities towards the payment of fixed establishments introduce an element of complication, especially in the case of communal forests with no actual cash receipts, or where these fall below the total amount of disbursements. Again, the annual value of grazing, forest products, &c., is estimated at thalers 741,420, or L.108,213, but only a tithe of this sum is actually collected and credited in the accounts, the rest being free to all or to the inhabitants of certain villages in the neighbourhood of the forests.

The charges include considerable sums paid in commutation of rights and servitudes, and for forest surveys and valuations (*Massenannahmen*), which will gradually diminish.

Hanover being now, and since the year 1866, a province of

the kingdom of Prussia, the forest establishments are gradually being remodelled and organised on the Prussian system, the leading characteristics of which are strong control and supervision.

The head office of the department for the whole kingdom is, of course, in Berlin, where it forms part of the finance department, which is divided into three heads or sections:—I. Direct taxes; II. Crown lands; III. Forests.

The forest establishments of the province of Hanover consist of 1 *Forstdirektor* and *Ober-forstmeister*, who is also a councillor, 20 *Forstmeisters* in charge of circles or divisions, forming also a committee or board of management and reference in all forest matters; 112 *Oberförsters* in charge of forest districts (*Revier*) averaging 11,000 morgen each, 403 Foresters who assist the *Oberförsters*, and have charge of portions of a *revier*; 343 overseers, under-foresters, &c., employed in watching and protecting the forests and supervising the work which is executed by hired weekly or daily labour, or on contract under supervision of the fixed establishments. A "*Forstrendant*" or cash-keeper is attached to each *Oberforsterci*, who receives and disburses all moneys in and from the forest cash chest, with which the *Oberforster* has nothing to do, although his accounts of sales, &c., should of course tally with those of the *Forstrendant*. For payment of labourers, &c., he gives orders on the forest cash chest, which are paid by the *Forstrendant*, whose books and cash balances are examined periodically by the *Forstmeister* in charge of the division, and accounts rendered to the head office of account in Hanover, and thence to Berlin.

In order to understand more clearly the position and nature of the duties appertaining to each grade or class of officials, it is necessary to bear in mind that the forests have all been surveyed, valued, and divided into blocks, and that there are accurate maps or plans representing not only the extent and situation of each forest district, but, by the use of different colours and shades of colouring, the description and age of the timber growing in each block or subdivision.

It appears advisable to describe briefly how this is effected, and the valuations (*Massenaufnahmen*) and plans maintained and renewed so as to form always reliable data for information and guidance.

Besides the employés already enumerated, there exists an office and numerous staff for the sole purpose of measuring, valuing, and forming working plans for the forests. This is called the "*Einrichtungs Bureau*," and the work carried on by it is perfectly distinct from that of the ordinary forest management and administration. In fact, all preliminary arrangements and settlements are worked out in this office, and when complete and

sanctioned by the Forst Direktor are carried out by the executive under the supervision of the Forstmeisters. The office consists of a superintendent (Vorstand), draughtsmen, and clerks, generally practical foresters, and a staff of surveyors (Geometer) and forest valuers (Taxator), who are as a rule candidates for the position of Oberforster.

When a forest is (or more properly speaking *was*) about to be taken in hand and worked systematically, a surveyor and valuator are despatched to the spot, the former working under the directions of the latter, who places himself in communication with the local forest officer and inhabitants interested, and obtains from them all the information in his power. The surveyor first surveys the whole district or tract, then the several blocks or subdivisions, as pointed out by the valuator, who defines them according to the description and age of the timber now standing, the situation, nature of soil, climate, and any other conditions affecting the rate of growth and nature of the crop which it may be advisable to grow in future years. Whilst the surveyor is engaged in demarcating and surveying these blocks, the valuator is employed in making valuations of the standing crop, calculating the annual rate of growth, inquiring into and forming a register of rights and servitudes with a view to their commutation, considering the best plan of working the forest for the future, the roads which it will be necessary to construct for the transport of timber; in fact, all the conditions of the forest which will enable him to prepare a detailed plan for future management (Einrichtungs plan), and the subordinate plans and instructions (Wirtschafts plane, &c.) for a term of years, to be handed over to the executive officer as his "standing orders."

A complete code of rules for the guidance of the valuers has been drawn up and printed, in which every possible contingency or difficulty is taken into consideration and provided for.

Having obtained all the information which he can on the spot, and ascertained the views and wishes of the inhabitants of the surrounding villages having rights or privileges in the forest, the valuator and surveyor return to headquarters, and proceed to prepare the working plan, maps, &c., from their notes and measurements.

When these are completed they are submitted by the superintendent of the bureau to the board or committee composed, as already stated, of the forstmeisters, and presided over by the Forst Direktor and other councillors of the finance department, who examine the plan in all its details, and are prepared to listen to any objections which may be made on the part of communities or individuals. These are, however, I am informed, very rare now-a-days, as the people have learnt that the action of the government officers is not antagonistic to their interests, and are

as a rule willing to allow them to settle matters to the best advantage.

The labours of the commission were formerly much greater than now, when they consist almost entirely in examining and revising the working plan submitted for their approval with regard to its merits as a part of the system of scientific forest management and conservancy. If palpable errors in calculation of yield, rate of growth, nature of the soil, are detected, or the measurements found to be inaccurate (a very small margin for error is allowed), the valuator may be ordered to do the work all over again without remuneration, for it should be stated that the valuator, surveyor, and, indeed, most of the officials of the "*Einrichtungs-Bureau*," are paid only when actually employed on any particular work, being at the same time enrolled as candidates or probationers for the post of "*Oberförster*" or "*Förster*." As a rule, the calculations and plans based on them are correct, having been thoroughly checked and overhauled in the office, and if all is approved they are made out in triplicate and signed by the Forst Direktor and Forstmeister of the division; one copy being sent to the executive officer for his guidance, another retained by the Forstmeister, and the original at the headquarter office for reference.

The "*Preface*" to the working plan contains a short history of the forest, its capabilities, requirements of the neighbourhood, &c. A sample of the headings into which it is divided is given at page 311, although no arbitrary rule or form appears to be laid down, and they vary according to circumstances and the views of the officers who prepare them.

The executive officer has thus in his hands accurate maps, on a large scale, showing each division and subdivision of the forest tract placed under his charge, and instructions for its management down to the minutest detail, the quantity to be felled annually, the extent planted, the state in which the forest should be found 10, 20, or even 100 years after the plans were drawn up; all these are calculated and laid down so that any change in the executive in no way interferes with the progress of operations, for all that the *Oberförster* has to do is to carry out the instructions given him, a margin being of course allowed for his discretion, and every allowance made for deviations from the working plan on account of natural and unforeseen causes, such as failure of seed, occurrence of storms by which thousands of trees are sometimes levelled to the ground, and the routine or systematic management interfered with for years, as the establishments are employed in working up and removing the fallen trees.

The *Forstmeisters* have no executive work, their duties being confined to the supervision and control of from four to six

*Oberförstereien* or *Revier* (*vide* note, page 312); in fact, they may be considered as occupying a position analogous to our deputy conservators, whilst the *Oberförsters* may be classed as assistants.

Our deputies and assistants in India have often been employed on exactly similar duties, but such is never the case here, where the control and even, as we have seen, the demarcation, valuation surveys, and preparation of working plans are kept perfectly distinct from the local executive, whose business it is to carry out the carefully digested plans and orders received from the controlling branch. Other systems have been tried but none have been found to work so well as this, which combines the advantages of efficient administration and supervision by officers who have themselves gone through the executive grade, and who are individually and collectively qualified to organise and supervise the work of others, with the concentration of the energies of the local officer on his own charge, with the object of carrying out to the best of his ability the orders he receives, without troubling him or diverting his attention, by making him responsible for the general plan of operations which forms part of that which is considered most applicable and beneficial for the whole nation or province.

The Forstmeisters make frequent inspections of the several districts in their division (*Bezirk*), and thoroughly supervise the work of the Oberforsters and their subordinates both in the forest and office work, reporting on the same to the Direktor. The Oberforsters submit annual reports, comparing operations actually carried on with those prescribed in the working plans, and giving reasons for any material divergence from them. They spend the greater portion of their time in the forest supervising the felling, planting, sowing, thinning, carting, and selling of timber. The laying down of roads is generally entrusted to one or more forest officers with special qualifications or aptitude for that work, but the actual work is carried out by the local officer. He has also a considerable amount of office work, issuing of licences for grazing, &c., and preparation of reports, returns, and accounts; but his duties may be considered as mainly out of door in comparison with those of the Forstmeister, who has more office work, comparing the result of operations and the rates in the several districts, collecting information and statistics for future guidance, settling disputes, and affording advice and assistance to his subordinates, and, as a member of the forest commission or committee, considering and revising working plans submitted from the "*Einrichtungs Bureau*."

The main object aimed at in any system of scientific forestry is, in the first instance, the conversion of any tract or tracts of natural forest, which generally contain trees of all ages and descriptions, young and old, good and bad, growing too thickly

in one place and too thinly in another, into what is termed a "*geschlossener Bestand*" (closed or compact forest), consisting of trees of the better descriptions and of the same age or period, divided into blocks, and capable of being worked—*i.e.*, thinned out, felled, and reproduced or replanted—in rotation, a block or part of a block being taken in hand each year. In settling and carrying out such a system important considerations and complications present themselves, such as the relation of the particular block, district, or division to the whole forest system of the province; the requirements of the people, not only as regards timber and firewood, but straw, litter, and leaves for manure, and pasturage; the geological and chemical formations and properties of the soil; and the situation as regards the prevailing winds, on which the felling must always depend, in order to decrease the chances of damage to a minimum; measures of precaution against fires, the ravages of destructive insects, trespass, damage, or theft by men and cattle; all these must be taken into consideration and borne in mind at each successive stage.

Nor must it be supposed that when once an indigenous forest has been mapped, valued, and working plans prepared, the necessity for attending to all such considerations is at an end. On the contrary, it is found necessary to have a revision of the working plan every 10 or 20 years, when new maps are prepared, showing the progress made towards the objects laid down in the original scheme, and although it is marvellous how generally the plan of operations is found to have answered and been adhered to on the whole, still the necessity of modifications and alterations of system do more or less present themselves. It may be found advisable to change the crop as in agriculture, to convert a hard wood into a coniferous forest or *vice versa*, to replace oak by beech, or to plant up (*unterbau*) the former with spruce or beech to cover the ground and keep down the growth of grass. All these and a hundred other details are constantly presenting themselves for consideration and settlement, and the local officer should be ever on the alert to detect the necessity of any change and bring it to notice, no less than the controlling branch should be prepared to suggest what is best to be done, and conversant with what had been done and with what results under similar circumstances in other districts and provinces.

Having thus given a general outline of the duties of the forest employes, and how the forest is first "taken up," divided, mapped, valued, and plans laid down for its future management, I shall state briefly what I saw of the practical working, and how the actual forest operations are carried on. I visited twelve districts or *reviers* with Director Burckhardt or one of the forest officers, and went thoroughly into the details of management, the various

methods of planting and sowing (artificial and natural), treatment of young trees in the nursery, thinning, removal of undergrowth, "*unterbau*" or planting up, felling, conversion of timber trees into logs or billets, removal from the forest, piling or stacking, and sales by auction; and whilst thus engaged in seeing operations in progress endeavoured to master the details of the system and general plan of operations by the study of books on forestry, in which Germany is very rich, rules and regulations for the guidance of the forest officers and subordinates, working plans, &c., &c.

As I spent most of my time in the reviers of Springe and Lauterberg-am-Harz, I shall confine my remarks mainly to these districts.

The Springe Revier is situated in the neighbourhood of the town of Hanover, from which it is reached by diligence in three hours (a railway has just been opened). The forest, which includes an extensive game preserve known as the "*Sau-Park*," may be considered as in the plains, although it ascends and clothes the sides of a low range of hills. The *Oberförsterei* is extensive, covering an area of some 19,000 morgen, or about 12,000 acres, mainly covered with oak and beech forest. Favoured by situation and depth of soil, the formation is mostly oolitic limestone and sandstone, the growth in this revier would be exceptionally good were it not for the damage done by the deer and wild pigs, which is very great, so much so that it has been found necessary to fence off the portions being cleared to allow of natural reproduction taking place.

As this plan of natural reproduction forms one of the most important points in the German system of forestry, it appears well to describe how it is conducted.

It has been already stated that the *Umtrieb*, or rotation of crop and periods into which it is divided, are fixed in the working plan. The usual *Umtrieb* for beech hoch-wald in Hanover is 120 years, divided into six periods of 20 years each, that is to say, when the forest has been brought into proper order there should be as nearly as possible equal areas under crop in each of the six periods, viz., from 1 year to 20, from 20 to 40, and so on. It is not imperatively necessary that the total extent in each period should be together; there may be 500 acres in one place and 50 in another, but it is advisable to group them as much as possible and work each tract regularly in succession, having regard to the direction of the prevailing winds, which do incalculable damage if once allowed to get into a forest by injudicious felling on the windward side. When a block arrives in the last period felling is commenced by what is called a *Vorbercitung* or *Besamungs-schlag* (preparatory or seed-clearing), which is very slight and scarcely to be distinguished from the



ordinary thinning carried on in the former periods. This is followed by a *Licht-schlag* (clearing for light) in the first year after seed has fallen (the beech seeds every fourth or fifth year) with the object of, 1st, preparing the ground to receive the seed; 2d, allowing it to germinate; and, 3d, affording sufficient light to the young seedlings. The finest trees are, as a rule, left standing, with the two-fold object of depositing the seed and sheltering the young trees as they come up. If there is a good seed year and sufficient rain the ground should be thickly covered with seedlings within two or three years after the first clearing, but it is generally found advisable to wait for a second seed year and aid nature by hand sowing, transplanting from patches where the seedlings have come up very thickly to the barer spots, and turning up the turf, and so giving the seeds a better chance of germinating.

When the ground is pretty well covered, the old trees are felled and carefully removed, so as to do as little damage as possible to the new crop; and the block recommences life, so to speak, nothing further being done until the first thinning.

The time allowed to elapse between the preparatory and the final clearing naturally varies much, according to situation and circumstances. In Hanover it rarely exceeds fifteen, and is often as little as eight years; but there would appear to be a growing tendency in other provinces to do away with this system of so-called "*Kahlabtrieb*," and remove the old trees so gradually that there can scarcely be said to be any clearing at all, the new crop being well advanced before the last of the parent trees are removed. This new system finds much favour in the Black Forest, as will be explained hereafter. At Springe the woods in the first period, where the final felling was going on when I was there, had, as I have stated, been fenced off so as to exclude the deer and pigs, and the natural reproduction had been particularly good, the hill slopes being thickly covered with seedlings; but a new and formidable enemy had presented itself in the shape of field mice, which nibble round the bark just above the surface of the ground. Thousands of seedlings had thus been destroyed, and as fast as blanks were filled up by transplanting, the young trees were attacked and killed. I left the Oberforster in despair at the wholesale destruction which was thus going on, and which, with all the knowledge and appliances of modern forestry at his command, he was powerless to prevent; but I have no doubt a sufficient stock will after all be left, supplemented by a little transplanting from the nurseries, which are well stocked.

The deer do great damage in the older beech woods by stripping the bark from the trees. These have then to be felled within a year or eighteen months, which interferes with thinning operations in other localities, and precludes any regularity in carrying

on operations and bringing the forest into proper order. These beech thinnings are cut into billets and piled ready for sale as firewood. The price realised is only about 4s. 2d. per cubic metre, say, 1½d. per cubic foot, which is very low.

I inspected tracts containing oak, beech, &c., representing all the periods, and compared the growth as recommended by Dr Brandis. There are some very fine beech woods in the second and third periods; but to my eye they require thinning, having fully double the number of trees to the acre which would be left in England. This, however, I afterwards found universal in German forests as compared with those I have seen in England and Scotland, and forms a vexed question on which much has been said and written on either side, too much to be summarised in this report; probably a happy medium would be found to be the best, and the peculiar circumstances of climate must always have much to say in such matters.

It may, however, be stated with reference to the remarks regarding pasturage in my report on the Scotch forests, that the presence of grass in plantations or young woods is throughout Germany considered as a sure sign of a faulty system of treatment, and consequently more or less unhealthy state of the trees. It is mainly with the object of preventing this that oak woods are planted up with beech, which grows well under shade and covers the ground so as to exclude the light, which, if admitted, must produce a growth of grass or herbage. The conditions under which the oak grows best being tersely expressed in German, "*Kopf frei boden bedeckt*" (*Anglicè*, Crown free soil covered or sheltered). I have, however, seen grass growing in English plantations which were very thick, and into which little or no light could penetrate, and am inclined to think that our moist sea climate has as much to do with it as the greater distance from tree to tree and the absence of "*Unterbau*." There is no doubt that the droppings from some descriptions of trees, particularly the larch, are very favourable to the growth of grass both before and after the trees are felled, as they produce a rich and fertile humus; and, although I am inclined to agree with the Germans that but little or no grass or herbage should be found in plantations in Europe, its presence in our Indian plantations does little or no harm to the trees, as it tends to keep the soil moist, and shelter it from the fierce rays of the sun, and that in any case the immense advantage of increasing the supply of green fodder, by having the grass cut during the first few years, and cattle admitted after the trees are past harm's way, more than counterbalances any negative damage to the trees or sacrifice in annual growth. In short, the presence of grass is no evil in itself, and the forester must never lose sight of the necessity of getting the ground in his plantations under cover in order to keep

the soil loose, and enable the atmospheric air to penetrate to the roots. This appears all important. Of course in mature or nearly mature forests, whether planted or indigenous, little or no grass should ever be found.

With regard to the *Unterbau* or planting up and rearing of two crops at the same time, the general opinion of English forest officers is antagonistic, and I myself thought it impossible without more or less detriment to both, and great damage to the young growth in removing the old crop; but I am now convinced, from what I have seen, that it is not only practicable and easily carried out by the exercise of a little ordinary care, but is, as a rule, highly beneficial, and deserving of being introduced, at least in a tentative manner, in England, and certainly in India, where we have, as in Germany, to provide a supply of firewood as well as building timber. I am convinced that if we can find the proper trees to grow under shade a great step will be made in our Indian forestry, and our plantations prove much more healthy and remunerative than hitherto. In this I am sure all our officers who have seen and studied the German system will agree, and where the undergrowth is for firewood and not to be reared as timber, the difficulty, small as it is, of removing the old crop is obviated by the *Unterbau* being removed first; in fact, it is probably cleared four or five times before the timber crop matures. As regards England, there is the difficulty that there would be little or no demand for the beech as firewood, and it is of little value for any other purpose; but I am inclined to think that such a demand will arise if the price of coal continues to increase, and that even if the planting up of oak woods can be made to pay its expenses a great point will be gained in the improvement in quality and more rapid growth of the oak; for it must be borne in mind that the main object of beech or spruce under oaks or Scotch firs, &c., is to cover the ground, to the importance of which I have just alluded, and not to produce firewood.

During my stay at Springe I saw also a good deal of planting out of hardwood trees from the nurseries, and in this respect also there is a good deal of difference from what is usual in England. In Hanover the seedlings are transferred at the age of from two to four years from the seed-beds into the "*Schule*," or nursery, where they are trained, pruned, and transplanted as often as required, until finally planted out, which is sometimes not done till they are twelve or even fourteen years old. So far the treatment does not vary much from that adopted in our nurseries in England, save that I think trees are rarely with us planted out so late, excepting for ornamental purposes, avenues, or other quite exceptional cases. Here we find the planting out of ten to twelve and even fourteen year old trees (called *Heisters*) the rule, and they are almost invariably put out without any nurses,

although these may be, and generally are, added a few years later in the shape of coniferæ of four or five years old planted between the rows or beech *Unterbau*. I do not mean that young hardwoods are never planted out at five or six years of age, but it is exceptional; and in no case that I have seen or heard of were nurses planted with the trees as with us, still less before the hardwoods, as in the New Forest.

The oak and beech *Heusters* after, say, ten years' schooling, are lifted, the branches carefully pruned into, as nearly as possible, a pyramidal form; the roots trimmed and shortened, the more woody parts being even sawn off, and only the fibrous rootlets left, and the trees then planted out in pits, which are dug just large enough to receive them. The distance apart at which they are planted varies, according to situation, from 8 to 12 feet.

Planting out of such large trees is naturally rather expensive, but I was told it ought not to average more than 1½d. each, all expenses included, which seems very low, considering that two men cannot plant more than 100 a day (including, of course, the digging of the pits), and that the cart hire from the nursery to the plantation site is expensive.

The absence of nurses struck me as very remarkable and deserving of attention, and I have since found it universal throughout Germany; in fact, the German foresters could not understand how we can manage with nurses (especially spruce, Scotch fir, or larch, which grow so rapidly at first) of the same age as the hardwoods.

They often plant spruce some years subsequently, and point out that even then it generally overtakes the hardwoods, and has to be cut down, which they do immediately its head shows above that of the oak or beech, and again and again, if necessary, before they (the spruces) are finally removed. I am not competent to express an opinion as to which system is correct, but both cannot be; and I must say I cannot recall an instance of damage done to hardwoods in Germany by the absence of nurses, whilst I have seen them injuriously crowded and their growth impeded by their presence in England.

I brought my stay at Springe to a close by an interesting visit to the Communal forest belonging to the town, and managed by a subordinate forest officer paid by the community, but who works entirely under the orders of the Government forest officers. One portion of the beech forest was particularly interesting, in which he was clearing and encouraging reproduction very gradually and carefully, as there was great danger, owing to the situation, of too much light being admitted, which acting on a very rich soil, would result in a very rank growth of grass and weeds sufficient to choke the seedlings. The result appeared very good, and does credit to the intelligence of the *Revierförster*.

The timber from this forest is taken by the burghers, each of whom is entitled to a certain annual quantity, and it is the duty of the forest officer in charge to supply this quantity and still retain the forest in good state—no easy task.

Beyond this, however, he has nothing to do with the burghers, who have no say in the management or working of the forest, nor can they alienate nor clear for cultivation any portion, although it is exclusively their property, and the State derives no benefit from it beyond the preservation of the timber and clothing the hill sides, which is considered, even in this temperate climate, a matter of paramount importance. The burghers cut up and cart away their allotments of timber at their own cost, and are free to dispose of or retain it for their own use as they may think best. Some such system might, I think, be adopted with advantage in India for the management and preservation of our village forests.

The Lauterberg Revier is situated on the lower slopes of the Harz mountains, and is 15,000 morgen (about 9400 English acres) in extent. The geological formation is of the Silurian period, consisting mainly of clayslate and grauwanke, and the soil is formed from the decomposition of the underlying rock more or less mixed with vegetable mould. The low-lying portions of the revier are covered with beech forests, which, as one ascends, give place to spruce intermixed with Scotch fir, and here and there a little larch. There is but little oak in the revier, but a good deal of hornbeam (*Carpinus Betulus*) interspersed with the beech.

The revier is particularly interesting and instructive from the opportunities it presents of observing the growth and treatment of both hardwood and coniferæ in the plains and on the hill sides. In fact almost every variety of treatment, sowing, planting, felling, and preparation may be met with and studied advantageously in this and the adjoining reviers in the Hanoverian Harz. The Oberförster, Herr Ohnesorge, is most painstaking, and ever anxious to explain and make things clear, which he is particularly well qualified to do, from his extensive and varied knowledge of forestry and the sciences connected with it. I have to thank him heartily for the trouble he took, to which I am mainly indebted for the insight I obtained into the details of German forest management and the object of each particular treatment or plan of operations. Several of our forest probationers have already benefitted by his teaching, and all speak in the highest terms of his never-varying kindness and desire to get them on with their studies.

I spent three weeks on the revier along with Mr Amery, a forest officer from the Punjâb. The forests are almost entirely Hochwald, and the annual growth or increase of wood is esti-

mated at as high as 50 cubic feet per morgen (80 cubic feet per English acre), the *umtrieb* being 120 years (for beech). This annual increment represents a total yield during this period of 6000 cubic feet per morgen, or upwards of 9500 cubic feet per acre, which is a high average. It is estimated that from one-fourth to one-fifth of the total yield is removed by thinning, but this varies much according to description of tree and situation.

We visited with the Oberförster portions of the forest representing all the periods of growth; nurseries and schools for seedlings; and witnessed planting being carried on in many different ways to suit the necessities of soil and situation; felling by the axe and with the cross-cut saw; squaring of hardwood and barking of pine stems to facilitate removal from the forest; slipping in log and on sledges; in fact, every variety of forest operations; and I only wish some of our Indian overseers had been present to learn a few practical lessons and useful hints to be applied in our hill forests. The natural reproduction of hardwood is carried on in the same manner as described at Springe, but little or no damage is done here by game. The tracts of Scotch fir and spruce are generally replanted two or three years after being cleared, the roots having meanwhile been carefully dug up, and for the most part used for the manufacture of charcoal, which is extensively carried on.

The young trees (spruce and fir) are scarcely ever *slitted in* as in Scotland, but pitted and transplanted with a ball. This is naturally more expensive, but, coupled with the careful previous clearing of the soil, prevents the ravages of the beetle, which was formerly a very deadly enemy here. In marshy ground a plan called *Hügel* or *hill* planting is often adopted, which consists in merely laying the young plant, which has been removed with a ball, on the top of the turf or spongy grass, and placing round it another turf removed from the adjoining ground (thus forming a mound, whence the name). This plan appears to answer well, and I saw many hundreds of acres which had been planted by it on the upper plateau of the Harz.

There are many other methods of planting adopted, too numerous to detail here. The steepest and most rocky sides of the hills are covered with forests which have been, so to speak, created by the ingenuity and labours of the forest department. In many such places, where even the few handfuls of soil placed round the young tree have had to be carried some distance, it is not contended that the first plantations will yield a direct pecuniary profit, but the improvement in climate by retention of the moisture, and reclamation of large tracts formerly barren and unproductive, is taken into account, besides which the droppings of leaves and needles from the trees will ere long create a soil

and vegetation, and ensure the success of plantations in future years and consequent surplus.

The Harz forests have from time to time suffered great damage from the attacks of insects, probably increased by the great dearth of small birds, which is most marked. Large sums have been expended in destroying the insects and beetles, and of late years these have proved successful, and the damage been reduced to a minimum. The knowledge which German forest officers possess on this and kindred subjects is very great. The oberforsters and even the forsters and overseers can generally identify every beetle or insect met with in the forest, know whether it is destructive or harmless, and in the former case how it attacks the trees, and what measures are most effective in preventing or checking its ravages.

We visited several other reviers in the neighbourhood of Lauterberg, and thus obtained a good general idea of the forests of the Harz mountains, the portion of which situated in the province of Hanover extends over 204,000 morgen, and yielded, according to the forest budgets of 1864 to 1866, an annual surplus revenue of 316,057 thalers, or about 4s. per morgen of the planted area, after deducting all charges for establishment, working, land-tax, &c. Four-fifths of the forest area is spruce, and the remainder for the most part beech hochwald. The department maintained in 1864 270 miles (English) of forest-roads in the Harz, and 480 miles throughout the whole province; and great attention is paid in each revier to the important matter of communications, without which the finest forest becomes comparatively worthless, save in so far as it affects the general welfare of the country.

In the adjoining revier to Lauterberg is a fine saw-mill (water power), erected some years ago at a cost of L 3750. The wheel drives one large rough-toothed saw (vertical) for quartering large beams, and eight vertical frame saws for planking. The system adopted is to debit the mill with all timber handed over to the manager at fixed rates, whilst he takes credit for the amount of sales to merchants. The balance and value of work performed by the mill is thus clearly shown, and the accounts of the executive officer remain clear and uncomplicated. I was informed that the results were generally favourable, but the department do not now have many mills in their own hands, and purpose selling this one, as competition has sprung up, and it is better if such operations as working up of timber can be carried on efficiently by private enterprise. All the departmental officers with whom I conversed concur, however, in stating that the saw-mills, of which the State had formerly a large number, were a necessity, and have contributed greatly to the financial success of the department. I think we may gather

a lesson from this for our guidance in India, where we cannot as yet expect private enterprise to erect and work saw-mills when and where required. We must set the example, and show the natives how to do it, saving, at the same time, a great deal of the waste of timber which now goes on, and must be felt sooner or later, only abandoning the mills and allowing them to pass into private hands, when we see that private enterprise and competition is sufficient to guarantee the carrying on the work in an efficient manner, and so as to supply the people with what they require without the evils of a monopoly.

The Lauterberg revier, and many of those bordering, so to speak, on the cultivated area in the plains, are much burdened with servitudes, which reduce the actual cash profits to a very small sum. These rights or servitudes are all clearly defined and registered, and when, as is the case for the most part, they consist of timber for the erection of houses or firewood, it is the duty of the executive forest officer to supply the privileged parties with the quantities to which they are entitled at the time and place laid down. Should he, however, find or imagine that the demand from this source exceeds the supply or annual yield, or that the forest is being worked actually at a loss, it is his duty to bring the circumstances at once to the notice of the Forstmeister, with a statement of the reasons which induce him to do so. The matter would then receive attention, and, if necessary, a complete revision and revaluing or stock-taking would be made. Should the local officer's view be found to be correct the rights of the villagers would be curtailed, or even suspended altogether for a term of years, the conservancy of the forest for the general good being considered paramount to all individual or class interests or privileges, even when the latter are of long standing.

Of course this rarely happens, but instances have been known owing to bad or injudicious management, failure of natural reproduction, damage by storms and insects, &c., &c.

A trip to the *Kloster* forests at Ilfeld with the Forstmeister brought our stay in the Harz to a close. These have for the most part been treated as *Mittelwald*, but a considerable portion is now in process of transformation into *Hochwald*. It struck me both here and in the *Mittelwald* at Rothenberg revier, that too many standard trees were as a rule left over, and that the coppice was in consequence poor and rarely attained any size. The proportion of trees to be left over in this description of forest is laid down as 12 *Baume*, or trees of the oldest class; 18 *Oberständler*, trees of medium age; and 30 *Lasrvidel*, or saplings left from the last clearing—60 trees in all, equivalent to 80 to our English acre, in addition to the coppice. The length of rotation varies from twenty to thirty years, and the coppice is estimated to produce 20 cubic feet per morgen per annum, whilst



the standard trees as above, should, under favourable circumstances, exhibit an annual increase of from 30 to 35 cubic feet per morgen.

The oak coppices which I subsequently visited with the *Forst-director* appeared very well managed, and yield a large profit. The young oaks are "schooled" for two years, then cut over and planted out, after which they are coppiced for the bark every sixteen years; the young wood of other sorts, such as birch, ash, hazel, &c., which may have sprung up having previously been cleared out, along with any oak shoots of no value for barking, and sold as firewood.

The last ten days of my stay in Hanover were devoted to the study and making extracts of working plans and short expeditions to reviers in the neighbourhood with the *Forst Direktor* and some of our forest students then in Hanover.

During these trips we tested and put in practice the various methods prescribed for estimating and valuing the quantity of timber on a measured area, the various instruments for measuring height and girth and ascertaining the annual rate of growth.

The most accurate information has been collected and statistical tables compiled by Herr Burckhardt with regard to the rate of growth, effects of thinning, comparative value of hardwood and coniferous plantations, methods of computing cubical contents of standing timber, annual increase, and many other kindred subjects. It would be impossible to give here even a very abridged statement of the results arrived at, and the same would not of course apply to India or even to England; still a study of the method in which the inquiries have been pursued and results deduced from the data acquired is very instructive, and should serve as a guide for similar researches in India, where they are much needed.

In the neighbourhood of Celle I had an opportunity of witnessing the method adopted for planting the fir successfully in moorpan or iron-band, extensive tracts of which have lain waste for centuries, and defied all the efforts of the forester. They are now gradually being covered with fine forests. The plan adopted is to plough, or, when necessary, trench with the spade to a depth of two feet or more, turning up the "iron-band" to the surface, where, in the course of one or two years, it decomposes and becomes a most excellent and congenial soil for the growth of the Scotch fir.

The fine communal forest of *Eilenried* was also visited and its management explained. This forest may be said to environ the town of Hanover, and contains some of the finest oak trees which I saw in Germany. It affords a most charming public recreation ground, whilst at the same time producing a good revenue. Director Burckhardt also took us to a revier where the so-called

*Plnter-betrieb* or *Wirtschaft* was still to be seen. This method of treatment approximates to what we are doing or have been trying to do in our Madras forests, and I believe in India generally, *i.e.*, merely to fell trees of the better descriptions as they arrive at maturity. It is generally condemned throughout Germany, as, unless most carefully managed with numerous and well-considered restrictions, it must lead sooner or later to a paucity of mature trees to produce seed, and hence to a deterioration in quality of the young crop, and eventually to the extinction or destruction of the more valuable descriptions by others more hardy, and saved from the axe by their comparative worthlessness.

The method adopted for the transformation of such tracts into regular plantations or forests is very instructive, consisting in gradually thinning out the less valuable sorts or white wood, and encouraging the growth of thick clumps or groves of those which it is wished to retain, which gradually reproduce themselves, and eventually, aided by artificial sowing or planting where required, cover the ground and constitute a close and regular forest.

It would not do to condemn the planter-betrieb entirely for India, as, within certain limits, it has its advantages, but there is no doubt that we should at least experiment as above, and favour the more valuable timber trees at the expense of the inferior descriptions. Some idea of this did present itself to Mr A. J. Stuart, sub-collector of Tinnevely, early in 1871, and proposals on the subject were under consideration when I came home.

#### BADEN.

The area of the Prince of Furstenberg's forests, under the charge of Oberforstrath Roth, is 80,617 Baden morgens, equal to about 72,555 English acres; and the annual yield is estimated at 56,000 massenklafter, stated to be equal to about 5,443,200 cubic feet, being an average of 75 cubic feet per acre of forest; but I am inclined to think there must be some difference betwixt the Baden foot and ours, *vide* Statement at page 314.

This being a private estate, the annual receipts and disbursements and surplus cannot of course be given, but the Oberforstrath informed me that the forests were on the whole economically worked, and the liberal sums expended on road-making, improvement of the rivers for floating, housing, forest officers, &c., were well repaid by the facility of transport, and contentment and zeal of the employes. The forests are, in fact, worked for the best profit compatible with their retention as capital, and it is evident that a private individual is not burdened by considerations of policy and the good of the people at large to the same extent as a State or even a community.

The forests of the estate are divided into sixteen reviers, each

under charge of a *Forstverwalter*, corresponding to the Oberforster of Prussia or Bavaria; and the whole upper establishments therefore consist of one Oberforstrath and one Forstrath (councillor) at Donaueschingen, and sixteen Forstverwalters in charge of the reviers.

Of the sixteen reviers, six are situated in the valley of the Danube, and consist chiefly of beech forests; three extend south of Donaueschingen towards the Bodensee (Lake of Constance), and contain mixed forests of hardwood and fir; whilst the remaining seven are in the Schwarz Wald (Black Forest), two in the northern and five in the southern portion, and may be said to consist entirely of Coniferæ, *i.e.*, spruce (*Abies excelsa*), Scotch fir (*Pinus sylvestris*), silver fir (*Abies pectinata*), black Austrian (*Pinus austriaca*), and a little larch (*Larix europæa*).

I had an interview with Oberforstrath Roth at Donaueschingen, and received from him the general information I have just stated, and an introductory letter to Forstverwalter Ganter at Rippoldsau, the revier mentioned in Dr Brandis's memorandum as being the most generally instructive.

The Rippoldsau revier is situated in the north-east corner of the Black Forest, "on the headwaters of one of the feeders of the Kinzig river." Rippoldsau itself, where the Forstverwalter lives, and where there is a large hotel and mineral springs, is about 2000 feet above the level of the sea. The area is 6459 morgen (Baden), equal to 5812 English acres, and presents a diversified appearance of hill and valley, the former running up to 3250 feet above the sea, with their steep sides clothed from base to summit with spruce and silver fir, which are the predominating trees.

I remained ten days at Rippoldsau, and inspected the several divisions of the forest, studying, at the same time, the general working plan and chart which the Forstverwalter placed at my disposal.

The main points deserving attention are—*first*, the peculiar character of the working or management as compared with the forests I had hitherto seen; *second*, the system of forest roads and transport of wood by land; *third*, the floating down the narrow mountain streams, and afterwards on the Kinzig river itself. The peculiarity of the working consists in the lengthened period over which the felling or clearing of a block extends. This is often as much as forty years from first to last; in fact, it is difficult in many instances to say when the block passes from one period (the oldest) to another (the youngest), so gradually is the old crop thinned out and removed. This method, which has long been more or less in force in the Black Forest, is now finding favour in other parts of Germany, as already noted in the Hanoverian and Saxon sections of this Report, as it is found pre-

ferable to the quick clearing, or "*kahl abtrieb*," formerly so much in vogue. It need scarcely be pointed out, however, that it requires much attention and intelligent treatment to ensure the success of such a system; for the seed will not germinate nor the seedlings flourish without a sufficiency of light, and the forest officer must be ever on the watch to see that they get it; and again, much greater care is necessary in felling and removing the old crop when the trees are already surrounded with saplings than when the seedlings of the new crop are not above 1 or 2 feet in height, and in this the axemen and foresters of the Black Forest are adepts; hence the damage done is really wonderfully slight, and a mere bagatelle compared with what it would be in less skilful hands.

The turf and thick herbage is, as a rule, removed in patches in order to receive the seed and give it a fair chance of germinating and making its way, and the nature of the herbage or undergrowth has not a little to say to the rate of clearing or quantity of light to be admitted in order to carry on the natural reproduction to the best advantage.

It may be said that a clearing which extends over thirty or forty years differs little from the "*Plnter-betrieb*" already alluded to; and there are, doubtless, some analogous points, but the similarity vanishes when the matter is carefully looked into, and there are many differences in the details of the system, which, while they require to be seen to be noted and thoroughly understood, effectually separate the one treatment from the other.

A great deal must always depend upon the circumstances of climate, situation, and establishments available, but the gradual clearing, with an eye to natural reproduction in force in these forests, appears to me particularly applicable to our forests in southern India, provided we can organise and retain in a state of efficiency—1st, reliable *employes* to watch each tract and ensure its treatment in a rational manner; and, 2d, the workmen to fell and remove the old trees in anything like so careful a manner as those in the Black Forest. My own experience of axemen and woodmen in India is certainly not favourable to our arriving at anything approaching to such a state of perfection; but I have not had to do with those in the Anamallays, who, I presume, are the best; and it has not hitherto been considered necessary to pay much attention to the matter, although each year its importance must become more manifest.

I was particularly struck with some "acquisitions" purchased by the Prince from peasants for 60,000 guldens (L.5000), which are gradually being converted from "*Hack Wald*" into fine high timber forest of spruce and silver fir. *Hack Wald* is a name given to a system formerly much in vogue in the Black Forest, and still pursued in remote, semi-civilised, and scantily-populated

localities, and has some points of resemblance with our "kumari" or "ponakâd," except that the main desideratum appears to be, as a rule, wood, especially hazels and osiers for hoops of barrels, baskets, &c., and not a crop of grain. It consists in clearing the ground of the "jungle" every sixteen or twenty years, cropping it for two years or more with grain or pulse, and allowing the coppice to grow up again. This treatment formed the subject of a very interesting discussion at the local forest gathering or "*Verein*" last year, in which, although the treatment, viewed from a forest light, was universally deprecated and condemned, many reasons were brought forward and explained to the meeting for its retention, in remote localities at least, for some years longer, as affording employment and a livelihood to a certain class.

The portion of the high marshy plateau of the Kniebis, included in the Rippoldsau revier, has now for the most part been drained and planted with spruce, which, considering the poorness of soil, exposure to high winds, and severe winters, is doing fairly well.

The *état* or yield of timber from the revier for the decennial period from 1865 to 1875 has been fixed at 380,000 cubic feet, or an average of 65 cubic feet per acre annually. It is divided for purposes of sale into classes known as Hollander-Holz, Bau-Holz, Säge-Holz, and Gemein-Holz. The Hollander-Holz consists of the fine stems of from 60 to 85 feet in length and 12 inches on the square, whilst the Gemein-Holz includes that under 18 feet in length and 9 or 10 inches in diameter. The average prices vary from 8d. to 6d. per cubic foot, having fallen considerably of late owing to the occurrence of severe storms, which have blown down and thrown on the market large quantities of timber from these forests and others in the neighbourhood.

The right of pasture in the forests is, as a rule, leased out by the executive forest officer.

The system of roads in the Rippoldsau forests appeared to me to approach very nearly to perfection, and the Forstverwalter is justly proud of what he has effected in this respect. I was fortunate enough not only to see those already in use, but several in course of construction. They may be divided into two classes, the first comprising roads 12 feet wide, and the second paths 6 to 8 feet wide. The former cost on an average nine guldens per rood of 10 feet, say 5s. per running yard, and the latter about two guldens per rood, say 1s. 1½d. per running yard; and it must be remembered that both are carefully laid out, and most substantially constructed with solid masonry, embankments, and culverts, wooden bridges, &c. There were 11,601 roods of such roads in the revier up to 1865, and 13,488 have to be constructed during the present period, *i.e.*, prior to 1875, making a

total length of nearly 5 miles. Many of the paths are now being transformed into roads of 12 feet in breadth. It must be borne in mind that the Government high road (one of the finest I have ever seen) may be said to intersect the forest, otherwise a much greater length of purely forest roads would be necessary.

In addition to the roads are the "*Riesen*" or slips, down which the timber is shot. The manner in which this is effected requires almost to be seen to be understood, and unfortunately slipping was not going on when I was there. The method was, however, repeatedly explained to me, and I think I could apply it, though I fear it would only be practicable with pine trees stripped of their bark, or perhaps with the Australian *Eucalypts*. The paths down which the timber is slipped are about six feet wide, running along the sides of the hills, and not necessarily very steep. Small pieces of wood or rollers are generally placed along them crossways at intervals of about two feet. When timber is to be slipped, smooth pieces, stripped of their bark, are laid along on either side, so as to form a trough or slide, down which the other stems are then shot. It is astonishing what curves they will thus get round, and the facility and the rapidity with which the work can be effected may be imagined from the fact that 300 stems can, with ease, be slipped in one working day. Where the curve is too sharp for the tree to get round, a right or acute angle is preferred, and the stem which has been shot down the first portion, say with the narrow part first, is, without much trouble, by the aid of a wonderful and simple instrument, called a "*krempe*," sent on its way inverted, *i.e.*, with its broad end or base in front. When the stems which form the trough get dry they are oiled, and sometimes bark is strewn on the "*road*" to make it more slippery. In winter the snow is taken advantage of, and then only sides or walls to the trough are required to prevent the stem shooting off the road. There is, of course, a great deal of knack in the construction of the *riesen* and management of the slipping, and a Black Forest woodman appears to be able to put his logs where he likes; in one instance, which I saw, they were made to shoot over a road (the King's or Grand Duke's highway), a temporary bridge being formed, under which carts and foot travellers could pass, and jump a river or stream some 20 feet wide, down which they were afterwards floated in rafts 2000 feet long!

The *krempe*, alluded to above, is an instrument with a heavy iron head, something between an adze and a pick, and a longish curved wooden handle, which in the hands of a skilful woodman is most useful in moving stems which it would be difficult otherwise to get hold of, far less to turn over or move as required. The curved handle gives great leverage, and the Black Forester is very expert in using the instrument, which is rarely out of his

hands in the woods or on a raft, the sharp end being driven into the log by a smart blow in order to lay hold of and move it from one place to another, or the broad thick end used as a hammer if required. I saw stems moved out of a clearing on to the road with comparative ease by half a dozen men provided only with krempes and a strong rope, for which we should have required elephants in Madras. The clearing was on the side of a steep rocky hill, and the trees, of an average length of 50 feet, were lying "higgledy-piggeldy," with a young crop of from eight to fifteen years old coming up all round them, so that it seemed all but impossible to remove them at all without sawing them into pieces, and still more so without greatly damaging the young growth. As I have said, however, it was effected without any great damage or trouble.

There is also an excellent description of sleigh in use for bringing firewood billets down the steep hills. These are very simple of construction, and made up by the woodmen themselves, and it is marvellous to see mere boys walking up the steepest hills with the sleigh on their backs, and returning, dragging, or rather guiding, it after them with a load which no six men could carry; in fact, which could not be brought down the steep inclines in any other way. The sleigh is "dragged" as required by means of chains and bundles of firewood tied behind, in order to prevent its going too fast, and running away with its load and the man or boy who is guiding it in front.

It is by these and similar means that the Forstverwalter is enabled to fell, slip, and float his trees to depôt at a cost of 4 kreuzers—say  $1\frac{1}{2}$ d. per cubic foot all round—and thus by selling at 6d. to 8d. per cubic foot realise a handsome profit, after paying all charges for supervision, planting, sowing, &c., &c.; and it is here, I think, that so much remains to be done by us in India, where the rates we now pay for felling and removing our timber, even in the rough and wasteful manner in which it is now done, are very high. Improvement in our means of communication, and introduction of and teaching the natives how to use better appliances for felling, and getting the logs out of the forests, and working them up when we have got them out, appear of paramount importance in our forest management.

The cost of 4 kreuzers per cubic foot is divided into—felling, 1 kreuzer, slipping  $1\frac{1}{4}$ , and floating  $1\frac{1}{4}$  kreuzers. It is impossible to convey by words an idea of how the latter is carried on. It must be seen to be understood and believed, and I am not sanguine of its ever being introduced into our Indian forests, except in a very modified degree, and on the larger rivers; in fact, the high specific gravity of most of our woods, and torrent-like nature of our mountain streams, preclude the idea in all but exceptional cases. Still it may not be without interest to state briefly how

it is carried on here, even in quite small streams of from 15 to 20 feet in width. The streams invariably require to be prepared more or less for floating, that is, cleared of any very large rocks or boulders, and "sleepered," if I may use the expression, with pieces of wood firmly fixed in the bed of the stream every few yards; in fact, in the same way as in the *Riesen*, except that the sleepers or rollers are much larger and placed further apart. These not only have the effect of preventing the formation of any very deep holes in the bed of the stream, but serve for the raft to slide along when it touches the bottom. Reservoirs for storing water are constructed in the same manner as I have described in the Report on Scotch Forests, as the floating cannot be carried on when the stream is in flood; in fact, the less water in it the better, so long as sufficient is stored up above to carry on the rafts. My first impression when I saw the *Floss* or float, consisting of stems from 20 to 60 feet in length tied together at the ends by branches or coir from the hazel, walnut, and silver fir, of which the hazel is preferred, and lying zig-zag in the bed of a mountain stream, up and down which they extended 1600 feet, was that it was simply impossible that they could ever be floated, still less steered down the stream with all its windings, and over the locks and rocks which occurred pretty frequently. This raft was not quite ready, and I had an opportunity of noting how it was constructed. It contained 880 stems, eight or ten of which abreast formed as it were a "link" in the long raft of 1600 feet. There were about 30 links or rafts in the floss. They are not fastened laterally, only at both ends to the next link. The breadth is greatest at about two-thirds from the prow, which is quite narrow, and consists of only two or three stems abreast (in front of all is a piece formed of old wood and raised out of the water like the bow of a whale boat, so as to lead the raft), and the largest and heaviest stems are placed in the broadest part and toward the stem or hinder part, which does not taper at all. The fastenings are made very secure, but not too tight, as they must allow for play.

There are two or three *Bremsen*, or breaks, by which the speed is regulated and the float brought to a standstill if required, and the charge of the largest of those, which is the farthest back, is the most responsible post, and devolves on the float-master himself, or, in his absence, the most experienced hand. When all is ready the water from above is let loose, and the raft or rafts which have hitherto been lying in the bed of the stream, which has probably not more than a foot of water in it, begins to float a little, but is not let go until about two-thirds of the water has passed, as it is a curious fact that when let go, if there is a steep fall in the river, it travels faster than the water, and has often to be stopped on its course to let the latter get ahead of it again.



The raft is manned by eight or ten men and boys, one or two of whom stand quite in the bow to guide the prow, the others make themselves generally useful, whilst at least one or two of the best hands stand by the float-master at the break, on which the safety and good guidance of the whole depends.

When let go it is exceedingly curious to see the forward part dart off at the rate of five or six miles an hour, and the several pieces or links which have been lying zig-zag and more or less high and dry gradually uncoil themselves and follow in its wake, till the whole dashes along at a great speed and apparently uncontrolled. Accidents are, I believe, rare, but this can only result from the floaters being trained to the work from their youth up (I saw little lads of six and eight going down in miniature floats); for one not accustomed to the work, it is well-nigh impossible to remain on the float, as it literally springs sometimes out of the water on touching a rock or obstruction, dashes round a rapid turn in the stream, or jumps over a weir or anicut, with a fall of several feet.

In this manner 40 or 50 miles can be got over in a day, if the stoppages, to allow of the water getting ahead, are not too frequent, or the stream does not become swollen by mountain rains. On reaching the main stream, in this instance, the Kinzig (the small stream is called the *Wolf*), the rafts are taken to pieces, and formed anew into those large rafts with which every one is familiar who has travelled on the Rhine, the Main, the Elbe, or the Danube.

The raft which I saw was shorter, and contained a greater proportion of small stems than usual, being the last of the season. They are, as a rule, at least 2000 feet long, contain 1000 stems, and are manned by 12 men and boys. The broad portion is always made as broad as the river or stream, failing which there is a tendency to turn round, or get side on to the stream.

Many of the Black Forest floaters have been induced of late years to migrate to Hungary, in order to introduce the floating down the mountain streams into the large pine forests there. They receive very liberal wages as an inducement to go, but, as a rule, return after a year or two, and complain bitterly of the climate, and laziness and want of aptitude of the "natives."

I trust the foregoing description of floating may serve to convey some idea of it to those who have not seen it, or have seen it only on large and comparatively slow flowing rivers; but, as I have said, it requires really to be seen to be understood and appreciated.

I do not know of any other points connected with forest management in the Rippoldsau revier which might with advantage be detailed here; so much is noted and learned by personal inspection and study of any occupation which cannot

be put down in writing, or communicated to others except in the course of practical working; and particularly is this the case in the Baden forests, where there is little theory or scientific talk, but a thorough practical knowledge and experience of what to do and how to do it, rendering a visit particularly instructive to a forest officer.

#### GENERAL REMARKS.

Forestry in Germany is truly a science, and differs very widely from anything I have seen called by the same name either in India or England. I do not advance the theory that the German system is perfect or applicable to all states or circumstances, and still less that we in England do not grow as fine trees, or do not know how to plant and rear young trees for timber. If any have doubts on these points I would point to the Swinley woods under the charge of Mr Menzies, and portions of the New Forest under Mr Cumberbatch, which may challenge comparison with any oak plantations of the same age on the Continent; but I do think, and am sure that any who have studied the subject and made themselves thoroughly acquainted with it by personal observation, will agree with me, that compared with most of the German States we are behindhand as regards the systematic and scientific management of forests on a large scale, and as a part of political economy to which it is incumbent on a Government to attend. In fact, looked at in this light, I venture to affirm that we are as far behind Germany in the knowledge and application of scientific forestry as we are in advance with regard to agricultural pursuits.

I grant that for England State forests are not a necessity (although I am not sure that we may not some day regret their absence or limited extent), for we can command the market for timber, burn comparatively little firewood, have a very small area, almost every acre of which is of great value either for building or agricultural purposes; and from the many large estates which exist throughout the country, and the naturally luxuriant growth consequent on a moist climate, is on the whole well wooded, although for the most part the woods are grown for luxury (*e.g.*, enhancing the beauty of the landscape, affording cover for game), and not merely regarded as timber-producing areas.

Again, private enterprise and intelligence effects a great deal more with us than on the Continent, where Governments are still often expected to originate and take the lead; and we often drift, so to speak, into the right channel without exactly knowing how or why.

I would therefore merely venture to remark as to Government or State forest management in England, that where it does

exist no efforts should be spared to make it as perfect and lucrative as possible, and I am convinced that this can only be done by the introduction of a thorough system of rotation and periods based upon carefully prepared measurements, valuations, and working plans, forming a definite plan of operations with certain objects in view, and not mere desultory planting liable to interruption at any time by a change in the Government or commissioner of woods, or on the *ex parte* statement of the commoners, whose rights should be definitely settled in one way or another.

In India, however, the position is quite different. Not only is there a large and ever increasing local demand to meet the wants of a population of upwards of 200 millions in the shape of building material and firewood, a demand which can never be met from abroad, but we have to consider such questions as climate, rainfall affecting the irrigation and cultivation of thousands of acres, and supply of wood fuel to the railways, any curtailment or enhancement of price in which means greatly increased working expenses and consequent loss to Government.

In India the people still look to Government for everything, and will do so for many a year to come, and there is little or none of that peculiar form of private enterprise which will plant and conserve forests on scientific principles, introduce better methods of felling and converting timber, and look into and provide for the future and its wants.

All this devolves on the Government, and particularly so, I consider, with regard to forests, which must be considered and managed as a whole, with reference to the general good, and cannot be left to the individual caprice of private individuals or even communities; for trees do not grow in a few months or a year, like rice or corn; nor can one portion of a forest be managed like a field without reference to the surrounding tract.

Most of the larger forest tracts are, besides, in the hands of the State as assessed or unassessed waste, and will, if properly administered, form a great and ever increasing source of strength to the rulers of the country.

The Government having granted by the gradual formation of a distinct forest service, the necessity of establishing a system of forest conservancy, and administering and working the forests by degrees on more well-defined principles and to the best advantage, the question naturally presents itself, where are we to look for a model or precedent on which to work?, and the reply appears ready; to Germany, where forestry and particularly the management of forests by the State has been carried on for hundreds of years. Not the mere planting of a few hundred acres here, or reserving a few thousand acres there, but a general system of forest management, commencing by a careful survey,

stock taking, definition and commutation of all rights and servitudes, careful experiments in the rate of growth, the best soil for each description of tree; in fact, in every branch of the subject, and resulting in what we find to-day, in Hanover, for instance, hundreds of thousands of acres mapped, divided into periods and blocks, and worked to the best advantage both with regard to present and future, and the annual yield of which now and for many years to come is known and fixed to within a few hundred cubic feet.

The great difference in climate and local conditions between India and Germany would doubtless necessitate important modifications and deviations from the plan pursued in the latter country at each stage in the development of our forest system; but I can see no reason why the broad principles of organisation and forest management should not be applied with success to our Indian forests, not hastily, or without careful preliminary experiment, but very gradually, feeling our way both as regards the best mode of treatment for the several classes of forest, and the wishes and interests of the people and State.

I would commence by the definition of what constitute State and communal forests, which should then be demarcated and surveyed, mapped, and valued, divided into blocks and complexes, and working plans prepared for their management.

Since I have studied the matter in Germany, this appears to me the very foundation and essence of good forest management, as by these steps we arrive at a definite plan and fixed idea of the objects in view, and how best to arrive at them, so that the management ceases to be desultory and personal, varying widely according to the views of the forest officer in charge, the district collector, or even of the subordinates of the revenue and forest departments. One very important matter to be settled, one which has, in fact, I may say, formed the stumbling block hitherto in Madras in all our attempts at dividing the forests betwixt the State, the communities, and individuals, is that of rights and servitudes; and I think that what I have seen and learnt on this subject alone during my tour in Germany repays the trouble and expense, even had I learnt nothing else. I advocate the speedy definition, registration, and, wherever possible, buying up or commutation of all such rights; and I think an Act and the appointment of a joint commission are necessary to enable us to do it; but I think I take a much broader and more liberal view of what constitutes rights and privileges than I held when I left India, and since I have seen and read that the same sort of thing has been universal in Europe, and that it is only now in some States that a settlement is being arrived at, and that the people are becoming alive to the fact that it is to their own interest to commute privileges, often vague and ill

defined, for a money payment, a fixed quantity of wood per annum to be handed over to them by the forest department, or the right of pasturage within a limited area. I think we cannot well take too broad a view in settling and defining the servitudes, even when the right is doubtful, but I am convinced that they should be defined, and as much as possible cancelled by liberal money compensation or annual allotment of timber or firewood. With regard to pasture, I would hope to be able to throw open all the forests, as they grew out of danger of damage from legitimate grazing, to the public at large, with certain well-considered restrictions and not easily evaded punishments in the event of mischief being done by the owners or herdsmen, and, if thought advisable, on payment of some small annual fee; but I deprecate the extension of any special rights to particular villages and persons, and consider it expedient to commute or endeavour to commute them where they already exist. No more analogous position to that which we are now in, and no better guide for settling matters justly and to the best advantage of all parties concerned, can be found than in the history of the progress of State forest administration and legislation in many of the German States.

Nothing struck me more wherever I went than the entire absence of fencing and enclosures, considered so imperatively necessary in our Indian and English forest management. Bunches of dry grass tied to the branches of the outer trees suffice to denote forbidden ground, and to deter people from entering or driving in their cattle. And I am informed that trespass in such places is very rare and generally inadvertent. There is, of course, a staff of watchers, and punishment follows detection; but considering the extensive area and consequent comparatively small chance of detection, it must be something else which exercises a deterrent effect, and I am inclined to look for it in the knowledge that the whole question has been thoroughly inquired into and settled, and that Government or its forest officers will not exclude man or beast unless absolutely necessary for the good of the forests, of which all classes have learnt to know and appreciate the value.

I do not think we have much to learn from the Germans with regard to the planting and rearing of young trees, but it is with regard to the best methods of managing groups of plantations or masses of forest that I consider we may with advantage take a leaf out of their book.

For instance, I would certainly introduce in a tentative manner, and at first on a very small scale, their system of rotation, clearing, and periods, and endeavour to bring forward a second crop before the first is off the ground, encourage the growth of the better descriptions, and keep down the less valuable, and to improve our "Plänter-betrieb," or selection of single trees to be

felled, so as gradually to arrive at groups of trees of the same age, description, and class, and eventually at blocks worked in rotation, and containing always a sufficient stock or crop coming on to meet the requirements of future years.

To arrive at all this, the most careful observations and experiments will have to be made as to the rate of growth and yield per acre of each description of forest, the conditions under which trees grow best and form the most timber—some requiring close and some open planting, some nurses and some not, some, like the oak, requiring a great deal of light, whilst others, like the beech, do well for many years in shade. All these points, and many more, demand attention, and till they are settled we shall be merely groping in the dark. In fact, I think it may be taken for granted that all we do in the way of forestry in the Madras Presidency during the present century at least, will, after all, be but experimentalising, which fact, however, need in no way delay the demarcation, survey, and settlement of the forests. These are, in fact, the first steps towards the initiation of systematic experiments, from the results of which valuable statistical data may be compiled for future guidance. Having said so much with regard to the chief points which have suggested themselves in connection with forest administration, legislation, and management as applicable to India, and regarding which, I think, I learnt not a little during my tour, I proceed to refer to the establishments employed.

Nothing that I can say or write can convey too high an idea of the attainments and thorough knowledge of their work possessed by German forest officers of all grades. I confess that prior to and during the first few weeks of my visit I was inclined to class a great deal of German forestry as much theory and little practice; and perhaps mountains are sometimes made of molehills, and more is written than the subject demands or justifies; but this may be said with equal truth of every science or profession, and a very little time served to convince me that the practice of the German foresters was as good, if not better, than their theory, and that they were in fact perfect masters of their duties in all their details. An Oberförster, and even many of the Försters and overseers, can tell the name, local and botanical, of every tree, shrub, and plant, classify it, and state its uses; name and classify every beetle and insect in the forest, and know whether they are harmless or destructive to trees, in what shape they do damage, and what are the best known preventive measures; inform you of the nature of the soil, and to what period the formation belongs, what trees will grow best, and why. All this is known thoroughly, theoretically, and practically.

Then, as to the revier, the exact yield, rate of growth, and annual increase in value of each block is thoroughly known, and

can be put down at any moment in figures by the *Oberförster*, who can tell at the commencement of each year how much timber he is going to cut and sell, and from what parts of the forest it is to come, how many acres have to be partially cleared for natural reproduction, planted, sown, thinned, or planted up.

The mere details are left, as a rule, entirely to the subordinates, who thoroughly understand them.

The *Forstmeisters* in charge of divisions possess not only the theoretical and scientific knowledge acquired in the forest academy, and the practical experience gained whilst they were *Oberförsters* in charge of a revier, but the more extended knowledge and wider views from their larger field for observation and comparison of causes and results. They are thus qualified to decide most points, revise working plans, and supervise operations generally, whilst settling complaints and complications in connection with the forest administration, advising the local head of the department, and compiling valuable reports and statistical information.

On the onerous duties of administration, legislation, and working of forestry in its most extended sense, which devolve on the higher grades, such as *Direktors*, *Ober-Forstmeisters*, *Oberland Forstmeisters*, and *Forst Räte*, I need say nothing more than that all those with whom I had the honour of coming into contact appeared thoroughly at home, not only with their particular duties and branch, but with all the details of State forest administration and management. In a word, the longer I remained the more I saw and felt how little I knew of the subject compared with those I met occupying similar or analogous positions in the forest service; and if the highest wisdom with regard to forestry is to know that you know nothing, I think I arrived very near it before my return to England.

I venture, however, to offer a few suggestions for the benefit of any of our forest officers who may be inclined to visit the German forests in future.

I think there are very few, unless they are Germans by birth, or have constantly kept up their German studies, who would find that they could with advantage attend a course of lectures at one of the academies without more than two months' previous residence and study of the language and forest technicalities. I am therefore inclined, with all deference to Dr Brandis' suggestions, almost to leave that out of consideration in sketching in what way time can be best utilised.

To those who do wish to go through such a course, and I am certain they will never repent it if they have sufficient time and knowledge of the language, I should say go to Hanover in September, and have at least one month in a revier before going to the academy. I do not think any revier could well be better

suited for the purpose than Lauterberg. The winter term at Tharandt commences on the 15th October, and that at the Prussian academies (which I presume are also open to forest officers) and Aschaffenburg about the same time. Spend the winter at the academy, and by the end of April proceed for at least another six weeks to a revier, and apply what has been learnt, and then devote another six weeks or two months to travelling through other forest districts and comparing the management and system in each. This course would occupy at least ten months, and I do not imagine many forest officers on leave will be prepared to devote so much of their time to the subject.

For those who could only devote a short time comparatively to the duty, or do not feel themselves sufficiently proficient in the language to benefit by a course of lectures, I would prescribe residence on a forest revier during six weeks, visiting other reviers in the same kingdom or province a fortnight, and travelling through the forests of other countries one month, making three months in all; and, if this time could be prolonged, I should advise a longer residence in the one revier. Dr Brandis strongly recommended me to confine my attention for the most part to one province or portion of a province, and I cannot say I actually learnt much in the shape of practical forestry after I left Hanover, always excepting the felling and transport of timber in the Black Forest, which require to be seen to be understood, and well repay a visit. I acquired much useful information in the other kingdoms, a great part of which, however, might be obtained from books.

It is difficult to say at what season of the year it would be best to commence the short course, but I am inclined to say not earlier than April, as the climate in North Germany is very raw and severe, and few forest operations can be carried on when the ground is covered with snow, although I did miss a forest survey in Hanover by not arriving even sooner than I did (the middle of March), which I much regretted. It is impossible in so short a time to see everything, and if you are at Hanover in the proper season you will be at Rippoldsau when comparatively little is going on, and *vice versa*.

Above all, let no forest officer imagine he is starting on a mere pleasure trip, and will find everything *comfortable* and to his taste. He will find there is a great deal of roughing it in a shape which I think the most difficult to accommodate oneself to—strange and unpalatable food, want of cleanliness and comfort, and a perfect change in the mode of life, habits, and associates to what one has been accustomed to in England. I would particularly counsel the undertaking of no tours or expeditions until a little shaken down, at home with the language, and accustomed



to the mode of life and style of food and lodging to be met with in a German village inn. I mention this as I spent much valuable time in making such tours at the outset, and derived little or no benefit.

Again, visitors must expect to be shown the same thing over and over again, which, although tiresome and seemingly useless, does good, I am convinced, in the end in firmly impressing things on one's memory.

I append tabular statements showing the extent under forest in proportion to total area, population, &c., in the principal German states, the figures in which are taken from Bernhard's "Forststatistik Deutschlands," to which work, "Die Forst Verwaltung Bayerns," and Director Burckhardt's publications, I am indebted for much valuable information.

*Specimen of Headings into which the Sketch or Preface of Working Plan may be divided (referred to at page 283).*

PART FIRST.—Existing arrangements and circumstances of the forest.

1. Extent and situation. 2. Measurements, when and by whom taken, &c. 3. Boundaries. 4. Roads. 5. Local conditions, communal rights and privileges, and present state of the forest. 6. Yield and disposal of the produce.

PART SECOND.—(a.) General working plan proposed.

1. Description and class of timber to be grown and with what object in view. 2. *Umtrieb* or rotation of crop, which varies according to description of timber, and whether grown as *Hoch*, *Mittel*, or *Nieder Wald* (see note below). 3. Division and subdivision of the forest with reference to the *Umtrieb* and *Umtrieb Zeit*.

(b.) Special working plan or regulations proposed.

- (1.) 1st, Complex treatment of the oak *Hochwald*.  
       2d, Do. do. of the beech do.  
       3rd, Do. do. of the oak and beech *Mittel* and *Nieder Wald*.  
       4th, Do. do. of the spruce and Scotch fir *Hochwald*.
- (2.) The *état* or estimated annual yield of the several complexes and of the whole forest.
- (3.) Improvement of the forest, soil, roads, &c, noting the leading points to be attended to during the next twenty years, *e.g.*:—
  - a. Pushing on the construction of roads in certain parts.
  - b. Planting or sowing up vacant spots now unproductive.
  - c. Removal of the worthless or less valuable descriptions of trees in certain blocks, and planting of spruce and fir. Further planting of clearings where the natural reproduction has more or less failed (specifying the exact localities in both instances).
  - d. Thinning, particularly in the mature and too thickly covered portions (to be specified), &c., &c.

PART THIRD.—General and concluding remarks explanatory of the accompanying detailed working plan and maps for the guidance of the executive.

*Note.*—It is difficult to find exact synonyms for many of the German forest terms, but the following, as used by Dr Brandis, may be adopted:—

*Hoch-wald,	. . .	High timber forest or high forest.
Mittel-wald,	. . .	Coppice with standard trees.
Nieder-wald,	. . .	Coppice.
Umtrieb,	. . .	Rotation.
Umtriebs-zeit,	. . .	Length of rotation.
Einrichtung,	{ Plan,	Plan of operations, or working plan.
Wirtschaft,		
Oberforsterei or	. . .	{ Forest district or range managed by an ober
Revier,	. . .	
Forst-bezirk,	{	Forest circle or division supervised by a
Massenaufnahmen.	. . .	Forst-meister.
Vorbereitung's Schlag,		Forest valuation surveys.
Besammung's	„	{ Terms applied to the several stages of clear-
Dunkel	„	
Licht	„	

\* The term is used to denote plantations or woods, at any period of their growth, which are to be left till mature, whether for timber or firewood supply; which are to be reproduced from seed, and in which the mature wood will constitute the chief object (*Haupt nutzung*); whereas in *Mittelwald* the coppice is equally if not chiefly the aim.

*Statement showing the Forest Area in proportion to the total extent and population in six of the largest German States and in the whole German Empire.*

1	2	3	4	5		6	7	8	9
NAME OF STATE.	Extent in Hectars.	Population per latest Census.	Extent of Forests.		Total.	Proportion of Forest to total extent per 100 Hectars.	Forest area per head of Population.	REMARKS	
			Under State Management.	Private.					
Prussia . .	84,831,924	24,019,567	3,803,888	4,333,965	8,137,853	hectars. 23·4	hectars. ·339	The hectar is 2·4711431 English acres.	
Bavaria . .	7,585,738	4,824,421	1,332,962	1,263,839	2,596,831	34·4	·536	The sources of information made use of in compiling this statement are Leo's Forst Statistik, Die Forst Verwaltung Baierns, Bernhardt's Forst Statistik.	
Wurtemberg .	1,950,597	1,773,396	399,169	195,933	595,102	30·5	·335	The forests classed as under State management (col. 4) include State, communal, and ecclesiastical forests.	
Baden . .	1,530,967	1,434,970	349,267	161,657	510,924	33·4	·356	I have retained the <i>hectar</i> in this statement, as it is the land measure now universal in Germany, and supersedes the various <i>morgrues</i> , <i>ackers</i> , and <i>tagwerks</i> , which were formerly so perplexing.	
Saxony . .	1,496,614	2,423,401	192,370	280,049	472,419	31·6	·195	The total area per head of population in the German Empire is thus 1·3 hectars, of which ·348 hectars is woodland.	
Mecklenburgh { Schwerin }	1,344,078	560,618	115,321	43,246	163,567	12·2	·292		
German Empire	54,102,769	40,089,170	7,247,862	6,692,679	13,940,541	25·7	·348		

*Statement showing the actual extent of purely State Forest in some of the German States and the Austrian Empire, with the yield per acre, and Explanatory Remarks.*

1	2	3	4	5
NAME OF STATE.	Area of Purely State Forests, in English Acres.		Yield per English Acre calculated on Column 2.	
	Productive.	Unproductive.		
			cubic feet.	
Prussia . . . . .	5,876,100	666,175	31.5	The figures for Prussia, Wurtemberg, and Baden are taken entirely from Bernhardt's "Forststatistik" (1872); for Saxony, from the "Tharunder Forstliches Jahrbuch" (1870); and for Bavaria, from the "Forststatistische Mittheilung" (1869). The unproductive area in Wurtemberg is not given by Bernhardt. For Austria I have taken the figures given in the latest annual report. From this table the average yield of the Prussian State Forest would appear low in comparison with other States, and there is no doubt that, owing to circumstances of soil and climate, the yield is below that of Saxony and Bavaria and the Black Forest. The great extent of the Prussian Kingdom must be taken into account, but still more the accurate nature of the statistics, which are for the year 1871, whilst those for Wurtemberg are for 1860, and Baden, 1856, no later data being given by Bernhardt. The yield in Prussia is greater in the western than in the eastern provinces.
Saxony . . . . .	378,555	15,614	72.5	
Bavaria . . . . .	2,079,835	238,788	63.	
Wurtemberg . . . . .	469,087	..	81.7	
Baden . . . . .	212,770	18,817	80.6	
Austrian Empire . . . . .	1,576,699	653,347	41.	

# REMARKS.

The figures for Prussia, Wurtemberg, and Baden are taken entirely from Bernhardt's "Forststatistik" (1872); for Saxony, from the "Tharander Forstliches Jahrbuch" (1870); and for Bavaria, from the "Forststatistische Mittheilung" (1869). The unproductive area in Wurtemberg is not given by Bernhardt. For Austria I have taken the figures given in the latest annual report. From this table the average yield of the Prussian State Forest would appear low in comparison with other States, and there is no doubt that, owing to circumstances of soil and climate, the yield is below that of Saxony and Bavaria and the Black Forest. The great extent of the Prussian Kingdom must be taken into account, but still more the accurate nature of the statistics, which are for the year 1871, whilst those for Wurtemberg are for 1860, and Baden, 1856, no later data being given by Bernhardt. The yield in Prussia is greater in the western than in the eastern provinces, and varies very widely; thus, we have the provinces of Danzig and Marienwerder with a yield of only 20 cubic feet per English acre; Bromberg, Minden, and Coslin with 23; whilst Hanover, Aachen, and Wiesbaden are all over 50, and Erfurt 56.5 cubic feet. Again, the areas in columns 2 and 3 are classed for Prussia as "devoted to the rearing of timber," and "not devoted to the rearing of timber," and I imagine that under column 2 a considerable extent of moor and really uncultivated area is included, whereas in the smaller States (Wurtemberg and Baden) only the area actually under crop is taken into account. For these reasons I am inclined to reject the figures for these two States altogether. The Austrian yield is also very doubtful, and the large proportion of unproductive to productive area is a noteworthy feature. As regards Bavaria, the system of calculation in "Klaffers" and "Vollenhunders" makes it difficult to arrive at accurate results, and I may mention that Bernhardt makes the Bavarian yield only 45 cubic feet per acre. For Saxony I believe the figures to be accurate, and there is no doubt that the Saxon yield is high, and steadily increasing, having been 60.4 cubic feet in 1854, 67.6 cubic feet in 1863, and now (1870) 72.5 cubic feet per English acre. Even with regard to this State, however, there is an element of uncertainty in the figures given, as Judeich, in Table I. of the Jahrbuch, gives the yield first as 1.23 Klaffers of 100 cubic feet per Saxon acre, = 89 cubic feet per English acre; and, second, 5.04 forst-metre per hectar, = 72.5 cubic feet per English acre, which latter figures I have retained as above.

## APPENDIX (A.)

### PROCEEDINGS AT BOARD MEETINGS.

#### MEETING OF DIRECTORS, 4TH FEBRUARY 1874.

*Present*—Mr Erskine of Cardross ; Mr Harvey, Whittingham Mains ; Mr Hunter of Thurston ; Mr Hutchison of Carlowrie ; Mr Maxwell Inglis of Loganbank ; Mr Mackenzie of Portmore ; Mr Ord Mackenzie of Dolphinton ; Mr Kenneth Mackenzie, C.A. ; Mr Bryden Monteith, Liberton Tower Mains ; Mr Scot Skirving, Camptoun ; Mr Stewart of Ingliston ; Mr Swinton, Holyn Bank ; Captain Tod of Howden ; Mr Pettigrew Wilson of Polquhairs. Mr HUNTER of Thurston in the Chair. Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes of Craigievar, Bart. ; Sir George Macpherson Grant of Ballindalloch, Bart. ; Dr Anderson ; Mr Dove, Crosshall ; Mr Glennie, Fernyflatt ; Mr Irvine of Drum ; Mr Smollett of Bonhill ; Mr Stevenson, C.E. ; Mr Seton Wightman of Courance ; Mr Walker of Bowland ; and Professor Wilson.

**PREMIUMS AND HUMANE TREATMENT OF ANIMALS.**—A letter was read from the Baroness Burdett Coutts bringing three subjects under the consideration of the Directors—1st, Premiums to men in charge of stock, and to women having charge of dairies and poultry ; 2d, the entering of asses and goats as an agricultural class for competition and exhibition ; and 3d, Systematic humane education in the treatment of animals. The Board remitted the subjects to the General Show Committee, and to a Special Committee on the Humane Treatment of animals.

**DISTRICT SHOWS.**—The regulation under which competitors can only carry one medal in the same year with the same animal was rescinded.

#### MEETING OF DIRECTORS, 4TH MARCH 1874.

*Present*—Sir George Macpherson Grant of Ballindalloch, Bart. ; Professor Balfour ; Mr Gillon of Wallhouse ; Mr Harvey, Whittingham Mains ; Mr Milne Home of Wedderburn ; Mr Hutchison of Carlowrie ; Col. Innes of Learney ; Mr Irvine of Drum ; Mr Small Keir of Kindrogan ; Mr Ord Mackenzie of Dolphinton ; Mr Kenneth Mackenzie, C.A. ; Mr Bryden Monteith, Tower Mains ; Mr Munro, Farnington ; Mr Murray of Dollerie ; Mr Scot Skirving, Camptoun ; Mr Smollett of Bonhill ; Mr Swinton, Holyn Bank ; Captain Tod of Howden ; Mr Walker of Bowland ; Mr Seton Wightman of Courance ; Professor Wilson ; Mr Pettigrew Wilson of Polquhairs. Captain Tod in the Chair.

Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes of Craigievar, Bart. ; Sir Henry J. Seton Stewart of Touch, Bart. ; Mr Glennie, Fernyflatt ; Mr Hunter of Thurston ; Mr Graham Spiers of Culcreuch ; and Mr Stevenson, C.E.

**THE LATE MEETING AT ABERDEEN.**—The Directors approved of the report of the Committee on the resolutions passed at Aberdeen on 24th October 1873, and agreed to adopt the same ; at the same time the Directors are desirous to convey to the noblemen and gentlemen who formed the deputation, and to all the gentlemen of the districts which they represent, their anxious desire to meet their wishes and to extend the benefits of the Society to the utmost of their power. The Report will be found at Page 356 of the last volume of the Society's Transactions.

**THE LATE MEETING AT GLASGOW.**—The SECRETARY reported that the deputation which it had been proposed to send from the West of Scotland, were now not to wait on the Directors ; and he read a letter from Mr Martin, yr. of Auchindennan, stating that a pamphlet embracing all that the deputation wished to lay before the Board had been printed, and would be sent to the Directors. Only four of those present having received the pamphlet, and none having been sent to the Secretary for distribution, the Board delayed the matter till next meeting.

ADDRESS TO THE QUEEN.—The following letter was read :—

“Whitehall, 17th Februry 1874.

“My Lord.—I have had the honour to lay before the Queen the loyal and dutiful address of the Highland and Agricultural Society of Scotland on the occasion of the marriage of his Royal Highness the Duke of Edinburgh, and I have to inform your Lordship that her Majesty was pleased to receive the address very graciously.—I have the honour to be, my Lord, your Lordship’s obedient servant.

(Signed) “R. Lowe.

“The Marquis of Lothian.”

CHEMICAL DEPARTMENT.—A letter was read from Sir Thomas Buchan Hepburn, of Smeaton, Bart., consenting to act as convener of this department. The Board delayed consideration of the arrangement proposed at the general meeting till next month.

PROPOSED NEW BYE-LAW.—Mr IRVINE of Drum gave notice of a new Bye-Law in conformity with the intimation at the general meeting on the 21st of January last.

PREMIUMS AND THE HUMANE TREATMENT OF ANIMALS, &c.—The reports by the committees named to consider the suggestions made by the Baroness Burdett Coutts were submitted, from which it appeared—1st, That to the medals in aid of premiums given by local societies, there should be added a class for men in charge of stock, and one for women having charge of dairies and poultry—viz., Male farm servant who has been longest in the same service, and who has proved himself most efficient in his duties, and to have invariably treated the animals under his charge with kindness. Female servant in charge of dairy and poultry, who has been longest in the same service, and who has proved herself most efficient in her duties, and to have invariably treated the animals under her charge with kindness.

2d, That as the arrangements for the Inverness show are far advanced, consideration of the subject of offering premiums for asses and milk goats should be delayed till next year.

3d, That the following additions should be made to the syllabus of examination, viz. :—

(1) Under Science and Practice of Agriculture and also under Veterinary Examination—The breeding, rearing, feeding, and humane treatment of the live stock of the farm; the different breeds; their characteristics; the districts where they are principally met with; and also the best and most humane system of horsebreaking.

(2) Under Natural History—The Orders—Hymenoptera, Diptera, and Coleoptera, with examples of insects injurious to farm crops belonging to each of the Orders; the preservation of birds which prey upon these insects, drawing a distinction between those which are beneficial and those which are destructive to crops.

(3) Under Science of Forestry—Insects injurious to trees; the preservation of birds which prey upon them, drawing a distinction between birds which are beneficial and those which are destructive to trees.

The reports also bear that the matter of aiding the cause of humane education was also under consideration; when, after some conversation, it was remitted to a sub-committee to draw up a circular on the subject to be sent to each School Board in Scotland.

The Board approved of the reports.

ORDNANCE SURVEY OF SCOTLAND.—The following reply to the memorial adopted at the general meeting of the Society on the 21st of January, was read :—

“H. M. OFFICE OF WORKS,

12 Whitehall Place, S. W., 27th Feb. 1874.

“Sir,—I am directed by the First Commissioner of her Majesty’s Works, &c., to acknowledge the receipt of your letter of the 22d ult., forwarding a memorial signed by the Marquis of Lothian, as chairman of a meeting of the Highland and Agricultural Society of Scotland, in reference to the progress of the Ordnance Survey of Scotland. In reply thereto, I am to inform you, on behalf of the Society, that the memorialists are under an erroneous impression in supposing that the survey of Scotland has been conducted as a separate branch of the survey of the United Kingdom, it having been made under precisely the same orders and regulations as that of the other parts of Great Britain. The whole mainland of Scotland has already been surveyed, and it is hoped that the survey of the islands will shortly be finished, there being no intention on the part of this department to postpone the completion of the survey of Scotland. Inasmuch, however, as the plans of Haddington, Fife, Kinross, Edinburgh, Kirkcudbright, Wigton, and the Isle of Lewis have already been engraved and published on the 6-inch and 1-inch scales, whilst no plans exist of the central counties of England, excepting those of the old 1-inch scale map, it is not proposed to replot the plans of the above-mentioned counties of Scotland on the 1-2500 scale before England is supplied with any maps of that scale, even for the mineral districts in which they are urgently required. In these circumstances it seems to the First Commissioner that the only mode

of expediting the survey of Scotland is by increasing the annual Parliamentary grant for the service, which is a question to be determined by the Lords Commissioners of her Majesty's Treasury rather than by this department.—I am, Sir, your obedient servant,  
(Signed) "GEORGE RUSSELL, Secretary.

"F. N. Menzies, Esq."

The Board resolved to send a deputation to Government on the subject.

# MEETING OF DIRECTORS, 1st APRIL, 1874.

*Present*—Admiral Sir Wm. J. Hope Johnstone, K.C.B.; Mr Dove, Crosshall; Mr Elliot, Hindhope; Mr Gibson, Woolmet; Mr Harvey, Whittingham Mains; Mr Hunter of Thurston; Mr Hutchison of Carlowrie; Mr George Auldjo Jamieson, C.A.; Mr Small Keir of Kindrogan; Mr Mackenzie of Portmore; Mr Kenneth Mackenzie, C.A.; Mr Munro, Fairnington; Mr Murray of Dollerie; Mr David Stevenson, C.E.; Mr Smollett of Bonhill; Mr Swinton, Holyn Bank; Captain Tod of Howden; Mr Seton Wightman of Courance; Professor Wilson; and Mr Pettigrew Wilson of Polquharn. Captain Tod of Howden in the chair.—Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes, Bart.; Sir Henry Seton Steuart, Bart.; Sir Thomas Buchan Hepburn, Bart.; Sir George Macpherson Grant, Bart.; Mr Erskine of Cardross; Mr Gillon of Wallhouse; Mr Milne Home of Wedderburn; Mr Irvine of Drum; and Mr Walker of Bowland.

ADDRESS TO H.R.H. THE DUKE OF EDINBURGH.—The following letter from Colonel the Hon. W. J. Colville was read:—

"CLARENCE HOUSE, ST. JAMES', S.W.,  
"16th March 1874.

"My Lord.—I have had the honour to lay before his Royal Highness the Duke of Edinburgh the address which you have forwarded to him upon the occasion of his marriage on behalf of the Highland and Agricultural Society of Scotland, and I am desired to express the sincere thanks of his Royal Highness for the congratulations and good wishes which it contains.—I have the honour to be, my Lord, your most obedient servant,  
(Signed) "W. J. COLVILLE.

"The Most Noble the Marquis of Lothian."

PROPOSED ALTERATION ON BYE-LAW No. 5.—The Secretary, in the absence of Mr Irvine of Drum, gave notice for the second time of an alteration on bye-law No. 5, in accordance with the intimation made at the general meeting in January last.

THE LATE MEETING AT ABERDEEN.—A letter was read from the Marquis of Huntly acknowledging receipt of copies of the report on the Aberdeen resolutions.

THE LATE MEETING AT GLASGOW.—The Secretary read the following report on the resolutions adopted by the meeting of members held at Glasgow on the 14th of January 1874:—

*Note.*—In the following report the resolutions of the Glasgow meeting are given *seriatim*, followed by the remarks by the committee on each:—

*Resolution 1.* "That this meeting is of opinion that, considering the great increase in the value of agricultural stock and implements, the additional cost of exhibiting (from high wages and other causes), and the scale of premiums offered by other less important associations, the Highland and Agricultural Society should reconstruct its premium list on much more liberal terms, among other changes giving in many cases substantial money premiums instead of the paltry silver medals awarded as 3d and 4th prizes."

The committee have to observe in answer to this, that the premium list for the show to be held at Inverness in July next was arranged some weeks before the meeting at Glasgow. On referring to it, it will be found that the number of the money premiums has been increased from 335 at Stirling to 437 at Inverness, and that the amount offered—L.2030, 16s.—exceeds what was offered at Stirling by L.170, 11s., and is L.730 more than the sum offered at Inverness in 1865, while the medium and minor silver medals have been withdrawn. The scale of premiums for the Glasgow show in 1875 will be fixed in November next; and as the Directors have sanctioned what is considered a very liberal list for Inverness, they will be prepared to submit to a meeting of members, to be held at Glasgow in December, a list worthy of the important counties embraced in the western district.

*Resolution 2.* "That no changes will be satisfactory, or merit the approval or support of exhibitors, which do not include a reconstruction of the Board of Directors, so as to give it a nationally representative character, the western district having been especially neglected in this respect hitherto."

The committee believe that the Directors are always glad to receive any suggestions from members in regard to the management of the Society. Since the

show was last in Glasgow, in 1867, the Society has had from time to time the benefit of the assistance and advice of the following noblemen and gentlemen connected with the western counties who have acted as office-bearers:—1. The Duke of Montrose; 2. The late Earl of Glasgow; 3. The late Lord Belhaven; 4. Lord Blantyre; 5. Sir Edward Colebrooke, Bart., M.P.; 6. Mr Boyle of Shevalton; 7. Mr Malcolm of Poltalloch; 8. Sir Michael Shaw Stewart, Bart.; Sir William Stirling-Maxwell, Bart.; 10. The Right Hon. Sir James Ferguson, Bart.; 11. The late Mr Spiers of Elderslie; 12. Mr Hozier, yr. of Maulds-lie; 13. Colonel Mure of Caldwell; 14. Mr Graham Somervell of Sorn; 15. Colonel Campbell of Blythswood; 16. Mr Ord Mackenzie of Dolphinton; 17. Mr Young, Keir Mains; 18. Mr Newton of Linnbank; 19. Mr Baird of Cambusdoon; 20. Sir Henry J. Seton Stenart, Bart.; 21. The late Sir James Colquhoun, Bart.; 22. Mr Smollett of Bonhill; 23. Mr Graham Spiers of Culcreuch; 24. Mr Pettigrew Wilson of Polquhairn. Next year, the show being at Glasgow, the whole of the vice-presidents and extraordinary directors will probably be selected from the Glasgow district, in addition to which, as has generally been the custom, it is likely that several of the ordinary directors will be taken from the same district. The Directors propose to carry through a new bye-law, giving the members a power to suggest to the Directors names from whom may be selected those to be recommended to the General Meeting.

*Resolution 3.* "That this meeting, while recognising the improvements in accommodation for stock introduced of late years, more especially at the recent show at Stirling, would urge the necessity of a further advance in the same direction, suggesting the adoption of several of the improvements carried out at some of the English shows."

It has ever been the anxious wish of the Directors and Committee in charge of the general shows to consider the convenience of the attendants on stock as well as the comfort of the animals exhibited. The Directors are glad that the meeting at Glasgow have recognised the improvements in the accommodation for stock made of late years, particularly in the late show at Stirling; and before the Glasgow meeting was held, it had been resolved, as far as possible, to improve on what was done at Stirling, especially in reference to erecting bothies for the attendants on stock, and a refreshment-room for their sole benefit.

The Directors unanimously approved of the answers by the committee on the resolutions adopted at the meeting held at Glasgow on the 14th of January last. They are aware that the special committee appointed to consider these resolutions have given the subject their fullest consideration, and they embrace this opportunity of assuring the members connected with the western counties of their earnest desire to meet their wishes where they can do so, keeping in view the usefulness of the Society, and the advancement of agriculture.

**CHEMICAL DEPARTMENT.**—Letters were read from the Marquis of Huntly recommending the following members to meet with the Chemical Committee:—Mr Wilson, Edington Mains; Mr Macdonald, factor, Cluny Castle, Aberdeen; Mr Barclay, M.P.; and Mr Johnston, Overtown, Auchnagatt.

The Board approved of the names suggested by Lord Huntly, and it was remitted to the Chemical Committee to meet these gentlemen and his Lordship on the 15th current, to consider the present position of the chemical department and suggest to the Board what alterations they would propose.

**INVERNESS SHOW 1874—*Thoroughbred Stallions.***—The Secretary reported that the competition for the L 50 prize offered by the Society for the best thoroughbred stallion, to serve this season in the Inverness district, took place at Inverness on the 20th of March, when six animals were brought forward; and that the judges—Mr Davidson of Tulloch, Mr Mackintosh of Daviot, and Mr Walker, Altyre—had awarded the premium to Mr Thomas Bland, Greystone, Alford, Aberdeenshire, for his bay stallion "Blucher;" and the second, or reserve number, to Mr James Drummond, jun., Blacklaw, Dunfermline, for his dark bay horse "Mesmer."

*Local Committee.*—The Board approved of the usual letters to the conveners of the counties embraced in the district connected with the Show, and to the Provost of Inverness as to the appointment of the local committee. The numbers to be named by the different counties were arranged as follows:—Inverness, 14; Elgin, 10; Nairn, 4; Ross and Cromarty, 12; Caithness, 8; Sutherland, 8; Orkney, 2; Shetland, 2; town of Inverness, 10. In all, 70.

**STEAM CULTIVATION.**—The committee to whom Mr Glennie's proposal to offer a premium for steam cultivation was remitted having given in their report, the Directors considered that as an exhibition of steam cultivators was to take place this autumn, under the auspices of the Society, it was inexpedient to offer the proposed premiums this year.

**AGRICULTURAL EDUCATION.**—The report of the annual examination of candidates for the diploma and certificate in agriculture, which took place on the 24th and 25th March,



was submitted, from which it appeared that the following gentlemen passed :—*For Diploma*.—Forbes Burn, Hardacres, Berwickshire, who obtained the certificate in 1872. *For Certificate and Diploma*.—Henry Erskine, Laurencekirk, Kincardineshire; and Richard Henderson, Coldstream. *For Certificate*.—William Kennedy, 89 Marine Parade, Brighton, who is, in terms of the bye-laws, entitled to present himself next year for the diploma.

**HUMANE TREATMENT OF ANIMALS.**—The Secretary reported that the sub-committee appointed to draw up a circular on the subject of aiding the cause of humane education had adopted the following letter, which had been sent to the chairmen of above 970 school-boards in Scotland :—

“3 GEORGE IV. BRIDGE, EDINBURGH.  
“31st March 1874.

“Sir,—The attention of the Highland and Agricultural Society of Scotland has been called to the advantages which might arise from its influence being exerted towards the encouragement of the humane treatment of animals. The material benefit which all concerned in agricultural pursuits derive from proper care being bestowed on the animals in their possession, or under their charge, seems, independently of other considerations, a sufficient reason why this Society should take a special interest in this subject. It has accordingly been resolved that both in the premiums offered by the Society, and in its examinations for its agricultural diploma and veterinary certificate, there should be a distinct recognition of the importance attached to the humane and judicious treatment of horses and other live stock. And if other public bodies can be induced to use their influence in the same direction, it is confidently hoped that an improvement may be effected in the feelings and conduct of those classes of the community on whom it is desirable that an impression should be made. None have so much power in this respect as the school-boards throughout the country. Cruelty towards the lower animals often originates in ignorance or thoughtlessness on the part of young persons who are in various ways brought in contact with them, and if opportunities were taken in primary schools systematically to inculcate on the children lessons of humanity very beneficial results might be expected to follow. The Directors of this Society, in whose name I address you, venture to bring the matter under your notice, and that of your Board, in the hope that the objects they have in view, and which they consider of national importance, may meet with your approval, and that the best means of promoting that object in the schools under your charge may receive your favourable consideration. They would therefore suggest that humanity to the lower animals should be recognised as a very necessary element of education.—I am, sir, your obedient servant,

“F. N. MENZIES, Secretary.  
The Secretary added that he would be happy to forward a copy of the circular letter to any member of school-boards or others who may wish it.

#### MEETING OF DIRECTORS, 6TH MAY 1874.

*Present*.—Sir Thomas Buchan Hepburn, Bart.; Mr Harvey, Wnittingham Mains; Mr Milne Home of Wedderburn; Mr Hunter of Thurston; Mr Small Keir of Kindrogan; Mr Mackenzie of Dolphinton; Mr Kenneth Mackenzie, C.A.; Mr Munro, Fairmington; Mr Murray of Dolerie; Mr David Stevenson, C.E.; Captain Tod of Howden; Mr Walker of Bowland; Mr Seton Wightman of Courance; Professor Wilson.—Captain Tod of Howden in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes, Bart.; Sir Henry J. Seton Stewart, Bart.; Mr Hutchison of Carlowie; Colonel Innes of Learney; Mr Irvine of Drum; and Mr Swinton, Holyn Bank.

**THE LATE MR BROWN, WESTERTOWN.**—Before proceeding to the business in the programme, the Directors resolved to record in their minutes the deep regret with which they have received the intimation of the death of Mr Brown, Westertown, one of their number, and instructed the Secretary to send a copy of the resolution to Mrs Brown.

**CHEMICAL DEPARTMENT.**—The Secretary read reports of meetings of the Committee on the Chemical Department, held on the 15th and 29th April, which embodied recommendations from the Marquis of Huntley's Committee, and suggestions from several members of the committee. He also read a memorial by the West Lothian Agricultural Association and a resolution by the East Lothian Agricultural Club on the subject, as well as modified suggestions for the reconstruction of the Chemical Department by Professor Wilson. The Board, after considerable discussion, resolved—1st, To remit back to the Chemistry Committee to consider and report on the present position of the Chemical Department, and suggest to the Board what alterations they would propose, keeping in view the proposals made by Lord Huntly's Committee with reference to the appointment of a chemist. 2d, To remit to the Council on Education to consider

what steps the Society should take regarding agricultural education, with reference to the discussion which took place at the general meeting in January. The recommendations from the Marquis of Huntly's Committee on Agricultural Education, and a letter from Colonel Innes of Learney were remitted for the consideration of the Council. Captain Tod of Howden, Mr Mackenzie of Portmore, Mr Pettigrew Wilson of Polquhairs, Mr Milne Home of Wedderburn, and Mr Walker of Bowland were appointed to assist the Council in its deliberations.

**VETERINARY DEPARTMENT.**—The report of the examinations for the Society's veterinary certificate, which took place on the 13th, 14th, and 15th of April, was submitted, from which it appeared that 42 students presented themselves for examination, and that 33 passed; that 17 silver medals had been presented to the students of the three colleges in Scotland for the best class examinations; and that two medium gold and two silver medals had been awarded at the Society's public examination for the best general and for the best practical examination. On a report by the Board of Examiners, the Directors resolved that in future the first preliminary examination should consist of two tables—namely, Anatomy, and Chemistry and Botany combined; and that *Materia Medica* be placed in the final examination. It was further resolved to recommend students to attend a longer curriculum, but the Board did not in the meantime alter the rule on this point so as to make it compulsory.

**PRIZES IN AGRICULTURAL CLASS.**—A letter was read from Professor Wilson stating that after a separate examination he had awarded the prizes from the Society to the class of Agriculture to John Bramwell, Blackaddie, Sanguhar; and Robert W. E. Murray, Housebyres, Galashiels. The papers being of the same merit the amount—£10—was divided equally.

#### MEETING OF DIRECTORS, 3d JUNE 1874.

*Present*.—The Hon. the Master of Lovat; Sir Thomas Buchan Hepburn of Smeaton, Bart.; Sir George Macpherson Grant of Ballindalloch, Bart.; Mr Graham Binny, W.S.; Mr Dove, Crosshall; Mr Erskine of Cardross; Mr Gillon of Wallhouse; Mr Harvey, Whittingham Mains; Mr Milne Home of Wedderburn; Mr Hunter of Thurston; Mr Hutchison of Carlowie; Colonel Innes of Learney; Mr Irvine of Drum; Mr Small Keir of Kindrogan; Mr Mackenzie of Portmore; Mr Kenneth Mackenzie, C.A.; Mr Monteith, Liberton Tower Mains; Mr Munro, Fairington; Mr Murray of Dollerie; Mr David Stevenson, C.E.; Mr Campbell Swinton of Kimmerghame; Mr Swinton, Holyn Bank; Captain Tod of Howden; Mr Walker of Bowland; Mr Pettigrew Wilson of Polquhairs; Professor Wilson—Captain Tod in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes, Bart.; Sir Henry J. Seton Stewart, Bart.; Mr George Auldjo Jamieson, C.A.; Mr Smollet of Bonhill; and Mr Seton Wightman of Courance.

**CHEMICAL DEPARTMENT.**—The report by the Committee on the Chemical Department was under discussion, and action was delayed pending a remit to a sub-committee to consider the various schemes which had been suggested, and what means the Society has at its disposal to meet the expenses required.

**AGRICULTURAL EDUCATION.**—The report by the Council on Education was approved of, and will come before the general meeting. It was agreed on the motion of Colonel INNES of Learney, to propose to the general meeting to memorialise the Committee of the Privy Council on Education on the propriety of establishing agriculture as a branch of the system of physical science taught under the superintendence of the department of Science and Art in the public schools. It was also resolved that the Society should offer a premium for a text-book on the application of science to agriculture.

**TRIAL OF IMPLEMENTS.**—On a report by the Local Committee, a silver medal was awarded to Messrs Thomas Pirie & Co., Kinnmundy, Longside, Aberdeenshire, for their patent heavy land cultivator, which was tried on the farm of Carsebonny, near Stirling, on the 14th May. The report bears that "the implement is designed to cut the land in slices in order to secure the speedy and uniform breaking down of heavy soil, in such a way as to retain the moisture in it, to ensure a braid of turnips, for which crop it is specially intended; and it seemed to the Committee to accomplish its purpose so satisfactorily that they recommend the award of a medal or certificate of merit. At the same time, they considered that, with three horses employed, the work was slowly performed." A patent potato planting machine, made by Mr William Dewar, Kellas, Dundee, and exhibited by Mr Thomas Wight, Perth, was tried at the same time. The Committee report that they thought this a most ingenious implement, and one which they believe may, without much difficulty, be made of great practical use; but in its present state it did its work imperfectly, and they did not feel warranted in recommending the award of a prize or medal.

**GLASGOW SHOW, 1875.**—A letter was read from Mr Marwick, City Chambers, Glas-

gow, stating that the Magistrates and Town Council had agreed to allow the Society, for the general show of 1875, the use of the Green, and that they had also voted a sum of £200 towards the funds of the Society.

The Directors instructed the Secretary to convey their best thanks to the Magistrates and Town Council of Glasgow.

#### MEETING OF DIRECTORS, 17TH JUNE 1874.

*Present*—Sir Thomas Buchan Hepburn, Bart.; Sir George Macpherson Grant, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Professor Dewar; Mr Erskine of Cardross; Mr Goodlet, Bolshan; Mr Harvey, Whittingham Mains; Mr Henderson of Stemster; Mr Hunter of Thurston; Mr Milne Home of Wedderburn; Colonel Innes of Learney; Mr Small Keir of Kindrogan; Mr Murray of Dolerie; Mr Munro, Fairnington; Mr Scot Skirving, Camptoun; Mr Smollet of Bonhill; Mr Stewart of Ingliston; Mr Swinton, Holyn Bank; Mr Seton Wightman of Courance; Captain Tod of Howden; Professor Wilson; Mr Pettigrew Wilson of Polquhairn—Captain Tod in the Chair. Mr F. N. MENZIES reported apologies for the absence of Mr Hutchison of Carlwrie; Mr Irvine of Drum; and Mr Kenneth Mackenzie, C.A.

The business had reference principally to the subjects to be brought before the General Meeting of this date.

#### MEETING OF DIRECTORS, 1st JULY 1874.

*Present*—Professor Balfour; Mr Graham Binny, W.S.; Mr Erskine of Cardross; Mr Gillon of Wallhouse; Mr Milne Home of Wedderburn; Mr Irvine of Drum; Mr Ord Mackenzie of Dolphinton; Mr Kenneth Mackenzie, C.A.; Mr Bryden Monteith, Liberton Tower Mains; Mr Scot Skirving, Camptoun; Mr Smollett of Bonhill; Captain Tod of Howden; Mr Walker of Bowland; Mr Seton Wightman of Courance; Mr Pettigrew Wilson of Polquhairn; Mr Wilson, Durn—Captain Tod of Howden in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes, Bart.; Sir Henry Seton Stuart, Bart.; Sir George Macpherson Grant, Bart.; Admiral Sir Wm. J. Hope Johnstone, K.C.B.; Mr Gibson, Woolmet; Mr Glennie, Fernyflatt; Mr Hunter of Thurston; Colonel Innes of Learney; Mr Swinton, Holyn Bank; and Professor Wilson.

**APPOINTMENT OF SPECIAL COMMITTEE.**—The following Committee was appointed to report, in terms of Mr Melvin's motion at the last general meeting:—Mr Walker of Bowland, convener; Mr Murray of Dolerie; Mr Melvin, Bonnington; Professor Wilson; Professor Balfour; Mr Mylne, Niddrie Mains; Captain Tod of Howden; Sir Thomas Buchan Hepburn of Smeaton, Bart.; Mr Hope of Bordlands; Mr Goodlet, Bolshan; Mr Irvine of Drum; and Mr Gibson, Woolmet. The motion was as follows:—"That the meeting ask the Directors to appoint a committee of their own number and others to investigate the income and outlay of the Society, and to endeavour to provide sufficient funds for the purposes of the Chemical Department and Education. Delay consideration of these subjects in the meantime."

**ORDNANCE SURVEY.**—Mr Dundas of Arniston, Mr Mackenzie of Portmore, and Mr Walker of Bowland, were appointed a Committee to watch over the progress of the Ordnance Survey of Scotland.

**STEAM CULTIVATION.**—It was resolved to send a deputation from Inverness to attend a field exhibition at Lairg of the steam plough for the reclamation of waste land, on Friday 31st July, the last day of the general show, if that day suits the convenience of the Duke of Sutherland.

#### MEETING OF DIRECTORS, 4TH NOVEMBER 1874.

*Present*—Sir Henry J. Seton Stuart, Bart.; Sir Thomas Buchan Hepburn, Bart.; Admiral Sir Wm. J. Hope Johnstone, K.C.B.; Mr Erskine of Cardross; Mr Gillon of Wallhouse; Mr Harvey, Whittingham Mains; Mr Hunter of Thurston; Mr Irvine of Drum; Mr Small Keir of Kindrogan; Mr Kenneth Mackenzie, C.A.; Mr Munro, Fairnington; Mr Scot Skirving, Camptoun; Mr Smollett of Bonhill; Mr David Stevenson, C.E.; Mr Campbell Swinton of Kimmerghame; Mr Swinton, Holyn Bank; Captain Tod of Howden; Mr Walker of Bowland; Mr Seton Wightman of Courance; Mr Pettigrew Wilson of Polquhairn; and Professor Wilson—Captain Tod in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes, Bart.; Sir George Macpherson Grant, Bart.; Mr Glennie, Fernyflatt; Mr Milne Home of Wedderburn; Mr Hutchison of Carlwrie; and Colonel Innes of Learney.

**THE LATE DR ANDERSON.**—Before proceeding to the business on the programme,

the following resolutions were passed :—1. That the Directors of the Highland and Agricultural Society desire unanimously to express the deep and sincere regret with which they have received the information of the death of their late chemist, Dr Thomas Anderson. 2. That the Society having in the minutes of the general meeting held on the 17th June last recorded, upon Dr Anderson's resignation of the office of chemist, their sense of the great importance of the services which he had rendered to the science of chemistry by his original researches, and to the Society's chemical department by the fidelity and accuracy of the work which he had for twenty-five years executed on its behalf, it only remains for the Directors to deplore the loss which they and the Society have now suffered. 3. That the Directors request the Secretary to transmit a copy of these resolutions to Mrs Anderson, with their respectful condolence and sympathy, upon the occasion of the painful bereavement which Mrs Anderson and her family have sustained.

**AGRICULTURAL EDUCATION.**—At the general meeting of the Society, held on 17th June last, it was, on the motion of Colonel Innes of Learney, agreed to memorialise Government on the subject of agricultural education. The following is the memorial agreed to :—

“To the Right Hon. the Lords of the Committee of Council on Education, the Memorial of the Highland and Agricultural Society of Scotland, incorporated by royal charters :

“Showeth, —That your memorialists beg respectfully to bring under your consideration the desirableness of affording to the working classes of the country instruction in the sciences specially bearing on agriculture. That at present there are no schools for these classes in Scotland where such instruction can be obtained, though the importance of affording the means of such instruction can scarcely be exaggerated. That agriculture is a great national industry, through which the country is supplied with the chief articles of food, and above three millions of the population of Great Britain obtain employment. That agriculture, to be successfully prosecuted, depends now on knowledge and training very different from what were formerly sufficient. That in times past crops were raised and stock reared by the operation of very simple and primitive processes. In the present age, the implements required by farmers depend on ingenious and complicated mechanical contrivances. Not only for the construction but for the management and working of these implements a knowledge of mechanics is required. The fertility of the soil needs to be stimulated by artificial compounds, which must be prepared with special reference to the nature both of soils and crops. The stock bred and fed on farms must obtain particular treatment, so as to ensure production of good meat in a short time and at small expense. All these processes depend more or less on a knowledge of mechanics, chemistry, and physiology. The most important recent improvements in agriculture have been made by persons versed in these sciences. That it is therefore necessary, both for a successful prosecution of the art and for its future development, that those of our population who wish to adopt agriculture as a profession should have an opportunity of obtaining instruction in the sciences bearing on agriculture. That it is understood to be the object of the Department of Science and Art to afford to the working-classes intending to follow any important industry means of instruction in the sciences bearing on it. Thus persons intending to be engineers, manufacturers, builders, miners, or mariners, are, in the schools or classes encouraged by the aid of the Science and Art Department, enabled to obtain the instruction required for those several arts and trades. They are instructed not only in the abstract principles of the sciences applicable to the several industries, but also in their practical application. For instance, the engineer is taught mathematics, geometry, machine construction, and applied mechanics ; the miner is taught geology, mineralogy, metallurgy, mechanics, and the principles of mining ; the mariner is taught astronomy, physical geography, mathematics, navigation, and steam. That a similar arrangement is required for agriculture ; and your memorialists now respectfully and earnestly ask that it shall as soon as possible be sanctioned. That what has already been done for engineering, machinemaking, shipbuilding, mining, navigation, and other great industries, your memorialists ask to be done for the not less important industry of agriculture. That with this view your memorialists ask that the grants of the department shall be declared to cover instruction in chemistry, mechanics, physiology, botany, morphology, steam, and other scientific subjects, when taught in the abstract, in so far as necessary for agriculture ; and also to cover instruction given in the ‘principles of agriculture’ as an applied science, and to place it in the same position as ‘machine construction,’ ‘applied mechanics,’ the ‘principles of mining,’ and ‘navigation,’ which are already included in the list of scientific arts towards instruction in which aid is given and in which examinations are carried out by the department. That your memorialists are happy to be able to state that there are many schools in Scotland into which the instruction now referred to will be at once introduced, if the department accedes to the application made by your memorialists. May it therefore

please your Lordships to take the premises into your favourable consideration, and your memorialists will ever pray. (Signed) ROBT. A. B. TON, Chairman.

"EDINBURGH, 14th July 1874."

To this memorial the following answer has been received :—

"SCIENCE AND ART DEPARTMENT, LONDON, S.W.,  
15th August 1874.

"Sir,—I am directed by the Lords of the Committee of Council on Education to inform you that their Lordships have had before them your letter of the 14th ultimo, forwarding a memorial from the Highland and Agricultural Society of Scotland, and in reply I am to state that while their Lordships are disposed to accede to the request contained therein, it is too late now to include for this year the science of agriculture in the list of subjects towards instruction in which aid is granted by this department. The case is therefore reserved for future but early consideration. I am, however, at the same time, to point out that the branches of general sciences, such as chemistry, mechanics, physiology, and botany, &c., which must form the foundation of any course of instruction in agriculture, are already aided, both in elementary schools and by the Science and Art Department. These subjects must to a certain extent be mastered by all students who intend to take up the applied science of agriculture. I am to add that the best means of giving effect to the suggestion of the Highland and Agricultural Society will be carefully considered.—I am, sir, your obedient servant,  
(Signed) NORMAN MACLEOD.

"F. N. MENZIES, Esq."

**EXAMINATIONS IN THE TECHNOLOGY OF AGRICULTURE.**—A letter was read from Mr P. Le Neve Foster, Secretary of the Society of Arts, London, with reference to the Highland Society founding scholarships in agriculture, and calling attention to a prospectus of examinations in the technology of agriculture and rural economy proposed to be held annually by the Society of Arts. The Board instructed the Secretary to inform Mr Foster that previous to the receipt of his letter a proposal to offer bursaries had been under consideration, and is now pending the report of a special committee on the finances of the Society.

**STIRLING SHOW, 1873.**—*Two-year-old Polled Heifers.*—The second and fourth premiums, awarded respectively to Mr M'Combie, Tillyfour, M.P., for "Pride of Alford," and to Sir George Macpherson Grant of Ballindalloch, Bart., for "Eva," have been forfeited, owing to the animals having failed to produce calves within the specified time. The second premium has been transferred to the Earl of Fife, for "Heather Blossom," which stood third.

*Two-year-old Galloway Heifers.*—The first and fourth premiums, awarded respectively to the Duke of Buccleuch for "Melantho," and to Mr Graham, Parcelstown, for "Hermione," have also been forfeited for the same reason. The first premium has been transferred to Mr Cunningham, Tarbreoch, for "Favourite," and the second to the Duke of Buccleuch for "Mellona."

**PROPOSED SHOW AT ABERDEEN IN 1876.**—Requisitions addressed to the Directors to hold their General Show at Aberdeen in 1876, from the counties of Aberdeen, Banff, and Kincardine, and the town of Aberdeen, were laid before the meeting, and remitted to the Committee on General Shows to prepare the classes of stock for which premiums should be offered.

**STEAM CULTIVATION.**—The minute of the Committee on Steam Cultivation of date 2d September, containing the resolution of the committee not to hold the proposed exhibition of steam cultivators this autumn, in consequence of their being no entries, was read and approved.

**VETERINARY DEPARTMENT.**—The SECRETARY reported that the preliminary examination of students for the Society's veterinary certificate took place on the 14th and 15th July, when thirty-seven students entered their names for examination—namely, 10 from the Edinburgh Veterinary College; 14 from the New Veterinary College, Edinburgh, and 13 from the Glasgow Veterinary College; and that only 6 failed to pass.

**DISTRICT SHOWS.**—The premiums awarded to Mr James Lawrence, Mills of Forbes, and to Mr Alexander Winton, Viewhill, for the second and third best mares at the local competition held at Inverness in August 1873, were forfeited, the mares having failed to produce foals within eleven months of the date of competition.

**HONORARY ASSOCIATES.**—A letter was read from Overintendant Hammerherre Holst, Chamberlain of His Majesty Oscar II., and F. A. Dahl, Director of the Central Agricultural School of Norway at Aas, expressing their deep gratitude for having been elected Honorary Associates of the Society at its last general meeting.

## MEETING OF DIRECTORS, 2d DECEMBER 1874.

*Present*—Mr Dove, Crosshall; Mr Erskine of Cardross; Mr Gillon of Wallhouse; Mr Milne Home of Wedderburn; Mr Hunter of Thurston; Mr Maxwell Inglis of Loganbank; Mr Irvine of Drum; Mr Small Keir of Kindrogan; Mr Mackenzie of Portmore; Mr Ord Mackenzie of Dolphinton; Mr Kenneth Mackenzie, C.A.; Mr Munro, Fairnington; Mr Murray of Dolerie; Mr Scot Skirving, Camptoun; Mr Stewart of Ingliston; Mr Campbell Swinton of Kimmerghame; Mr Swinton, Holyn Bank; Captain Tod of Howden; Mr Walker of Bowland; Mr Seton Wightman of Courance; Professor Wilson; Mr Pettigrew Wilson of Polquhain; Mr Wilson, Durn. Captain Tod of Howden in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir Henry J. Seton Stuart of Allanton, Bart.; Sir Thomas Buchan Hepburn of Smeaton, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; Professor Balfour; Mr Gibson, Woolmet; Mr Smollett of Bonhill; and Mr David Stevenson, C.E.

**GENERAL SHOWS**—GLASGOW SHOW, 1875.—The Committee on General Shows met on the 18th November, and suggested—(1.) That the show should be held on the 27th, 28th, 29th, and 30th July. (2.) That sections for Highland stallions under 14½ hands, Highland mares or geldings between 13 and 14½ hands high, and for English Leicester tups, and ewes or gimmers, should be added to the list. (3.) That special premiums should be awarded on the report by the Implement Committee for machines for thinning turnips and for spreading manure. (4.) That premiums to the amount of L.2500 16s., in the following proportions, should be offered, being an increase of L.900 over what was offered at Glasgow in 1867:—Cattle, L.970; horses, L.586; sheep, L.384; swine, L.93; poultry, L.138; dairy produce, L.45; medium gold medals to former prize animals, say L.160; six silver medals to breeders of best aged bulls and best stallion, L.4, 16s.; extra stock, say L.40; implements, say L.80—making a total of L.2500, 16s. (5.) That the following new rules should be added to the regulations:—“Any artificial contrivance or device of any description found on an animal either for preventing the flow of milk or for any other purpose, will disqualify that animal from being awarded a premium, and the owner of said animal will be prohibited from again entering stock for any of the Society’s general shows.” “Protests lodged for causes which the protester produces no good evidence to substantiate, will render him liable to be reported to the Board of Directors, with the view, if they see reason, to his being prohibited from again entering stock for a general show.” The report was approved of; and the Secretary was instructed to submit the premium list and regulations to a meeting of the members to be held in the Queen’s Hotel, Glasgow, on Wednesday the 16th current.

**ABERDEEN SHOW, 1876**.—The classes for the proposed show at Aberdeen in 1876 were approved of by the Board, and will be laid before a meeting of members to be held at Aberdeen on Friday the 18th current.

**DISTRICT COMPETITIONS, &c.**—The reports by the Committees on District Shows and on Cottage Competitions, detailing the awards at the various competitions held during 1874, and suggesting the districts for next year, were submitted and approved of. The following new rule was also adopted:—“When a grant has expired, the district cannot apply again for aid for two years.”

**HORNING CATTLE**.—Mr Menzies read a letter from Principal Walley, stating that when being examined as a witness before the Sheriff at Stonehaven, in a case of cruelty to animals, he was asked if he was not aware that the Highland Society approved of the practice of “horning” cattle. The Directors instructed the Secretary to inform Mr Walley that the Society had not only never approved or sanctioned such a barbarous operation, but that they would do all in their power to put an end to such a cruel and useless practice.

## SPECIAL MEETING OF DIRECTORS, 9th DECEMBER 1874.

*Present*—Sir Thomas Buchan Hepburn of Smeaton, Bart.; Mr Erskine of Cardross; Mr Gillon of Wallhouse; Mr Harvey, Whittingham Mains; Mr Milne Home of Wedderburn; Mr Hunter of Thurston; Mr Hutchison of Calowrie; Mr Murray of Dolerie; Mr Scot Skirving, Camptoun; Mr Stewart of Ingliston; Mr Campbell Swinton of Kimmerghame; Mr Swinton, Holyn Bank; Captain Tod of Howden; Professor Wilson; Mr Pettigrew Wilson of Polquhain.—Captain Tod in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir Henry Seton Stuart of Allanton, Bart.; Admiral Sir William J. Hope Johnstone, K.C.B.; and Mr Smollett of Bonhill. The business before the meeting had reference principally to the Chemical Department and Agricultural Education. It was resolved that a chemist be appointed; and it was remitted to the Chemistry Committee to define his duties.

## MEETING OF DIRECTORS, 6TH JANUARY 1875.

*Present*—Sir George Macpherson Grant of Ballindalloch, Bart.; Professor Balfour, Mr Graham Binny, W.S.; Mr Erskine of Cardross; Mr Gibson, Woolmet; Mr Gillon of Wallhouse, Mr Milne Home of Wedderburn, Mr Hunter of Thurston, Mr Hutchison of Carlowrie, Mr Irvine of Drum, Mr Small Keir of Kindrogan, Mr Kenneth Mackenzie, C.A.; Mr Monteith, Liberton Tower Mains; Mr Scot Skirving, Camptoun; Mr Swinton, Holyn Bank; Captain Tod of Howden, Mr Walker of Bowland; Mr Seton Wightman of Courance, Professor Wilson, Mr Pettigrew Wilson of Polquharn. Captain Tod of Howden in the chair. Mr F. N. MENZIES reported apologies for the absence of Sir William Forbes of Craigievar, Bart.; Sir Thomas Buchan Hepburn of Smeaton, Bart.; Mr Glennie, Fernyflatt; Mr Harvey, Whittingham Mains; Mr Murray of Dollerie, and Mr Smollett of Bonhill.

**GENERAL MEETING.**—The programme of business for the anniversary General Meeting of the Society in January was arranged.

**NEW MEMBERS.**—The list of candidates for admission as members at the General Meeting was submitted.

**FINANCE.**—Abstracts of the accounts were submitted and signed in terms of the bye-laws.

**OFFICE-BEARERS FOR 1875.**—The Secretary reported that the noblemen and gentlemen to be proposed by the Directors for election at the General Meeting to fill the vacancies in the list of office-bearers had agreed to act.

**GLASGOW SHOW, 1875.**—The report of the meeting of members, held at Glasgow on the 16th of December, when the premium list and regulations for the General Show to be held there in the last week of July were submitted and approved of, subject to the following suggestions for the consideration of the Board—(1) That there should be four prizes in all the sections for Ayrshires and Clydesdales, and an increase on the premiums for young horses and mares with foal at foot; (2) that there should be sections for light and heavy weight hunters, also for roadsters and for jumping; (3) that there should be a section for driving horses, shown in harness in traps; (4) that the premiums for dairy produce should be increased, and that a section should be added for Dunlop cheese.

The Board agreed to all the suggestions except the one for driving horses shown in harness.

**PROPOSED SHOW AT ABERDEEN, 1876.**—A requisition from the eastern division of Forfarshire in favour of holding the Show for 1876 at Aberdeen was reported; and a letter was read from Mr Yeats, the Secretary of the Royal Northern Society, intimating that the committee of that Society had unanimously proposed to recommend that a grant of L.100 should be given in aid of the funds. The Secretary reported having attended a meeting at Aberdeen on the 18th of December, when the classes of stock as arranged by the Directors had been approved of, subject to the following suggestions—(1) That sections be added both in the shorthorn and polled classes for two-year-old heifers with their own calves at foot; (2) that two sections be added for polled oxen calved after 1st January 1873 and after 1st January 1874.

The Board agreed to both suggestions.

## MEETING OF DIRECTORS, 20TH JANUARY 1875.

*Present*—The Duke of Buccleuch, K.G.; The Marquis of Lothian; The Right Hon. Sir Wm. Gibson-Craig of Riccarton, Bart.; Sir Wm. Forbes of Craigievar, Bart.; Sir George Macpherson Grant of Ballindalloch, Bart.; Admiral Sir Wm. J. Hope Johnstone, K.C.B.; Mr Curror, The Lee; Mr Dundas of Arncliffe; Mr Erskine of Cardross; Mr Gibson, Woolmet; Mr Gillon of Wallhouse; Mr Milne Home of Wedderburn; Mr Hunter of Thurston; Colonel Innes of Learney; Mr Irvine of Drum; Mr Geo. Auldjo Jamieson, C.A.; Mr Small Keir of Kindrogan; Mr Mackenzie of Portmore; Mr Kenneth Mackenzie, C.A.; Mr Munro, Fairnington; Mr Scot Skirving, Camptown; Mr David Stevenson, C.E.; Mr Campbell Swinton of Kimmerghame; Mr Swinton, Holyn Bank; Captain Tod of Howden; Mr Walker of Bowland; Mr Seton Wightman of Courance; Mr Pettigrew Wilson of Polquharn; Professor Wilson. Captain Tod in the Chair. Mr F. N. MENZIES reported apologies for the absence of Sir Henry J. Seton Stewart of Allanton, Bart.; Sir Thomas Buchan Hepburn of Smeaton, Bart.; Mr Glennie, Fernyflatt; Mr Harvey, Whittingham Mains; Mr Hutchison of Carlowrie; Mr Murray of Dollerie; and Mr Smollett of Bonhill.

The business had reference principally to the subjects to be brought before the General Meeting of this date.

## PROCEEDINGS AT GENERAL MEETINGS.

### GENERAL MEETING, 17TH JUNE 1874.

Captain TOD of Howden, senior Director, in the Chair.

**THE LATE LORD COLONSAY.**—The CHAIRMAN moved the adoption of the following resolution:—"That the Society record in the minutes the deep regret with which it regards the death of Lord Colonsay, and its sense of the valuable assistance which the Society has for so long a period received from him as a member of the Council on Agricultural Education."

The motion was unanimously adopted.

**ELECTION OF MEMBERS.**—The CHAIRMAN then stated that the next business was the election of members. These were divided into three classes—first, Honorary Associates; second, Ordinary Members; and third, those entitled to be members from having gained the Society's diploma. Mr F. N. MENZIES (the Secretary) submitted the following list of Honorary Associates recommended for election by the Directors:—Christian Holst, chamberlain to his Majesty King Oscar II., and Norwegian Court paymaster; and Ferdinand August Dahl, Director of the Royal Higher Agricultural School at Aas, Christiana.

The election of these gentlemen was agreed to.

The SECRETARY next read a list of 135 gentlemen who were ballotted for and admitted as members.

The SECRETARY afterwards submitted the names of the following gentlemen, holders of the Society's diploma, for election:—Forbes Burn, Hardacres, Coldstream; Henry Erskine, Dalladies, Brechin; Richard Henderson, Coldstream.

The election of these gentlemen was approved of.

**NEW BYE-LAWS AS TO OFFICE-BEARERS.**—Mr MURRAY, Dollerie, moved the proposed alteration of the bye-laws, providing that the four Vice-Presidents and ten Extraordinary Directors shall retire annually, instead of one-half the number each of two successive years.

The alteration was unanimously approved of.

Mr G. AULDJO JAMIESON, C.A., on behalf of Mr Irvine of Drum, read the following addition proposed to be made to the bye-laws:—"The Secretary shall thirty days before the meeting of Directors at which the list of Ordinary and Extraordinary Directors for the ensuing year is to be made up, intimate by advertisement in any two or more of the Edinburgh newspapers that the Directors are prepared to receive from members of the Society, within eight days from the date of such intimation, the names of such members as they may desire to suggest for the consideration of the Directors in making up the list to be recommended for the adoption of the Society at the General Meeting in January."

The CHAIRMAN said it must be borne in mind that this proposed alteration would not come into operation till after next General Meeting, as all alterations must be approved by two General Meetings.

**ORDNANCE SURVEY OF SCOTLAND.**—Mr WALKER of Bowland read the reply from her Majesty's Office of Works to the memorial adopted at the General Meeting of the Society on the 21st January upon this subject. The memorial has already been published. It may be remembered that the First Commissioner stated that it seemed to him that the only mode of expediting the survey of Scotland was by increasing the annual Parliamentary grant for the service. Mr Walker went on to say that he believed that a deputation which had been appointed for the purpose had not yet had a conference with the Government, but he hoped it would soon take place. He trusted they would impress on the Government the necessity of a larger outlay on this great work. It was clear that the obstacle in the way was financial; and it was also clear to him that if they did not proceed more rapidly than hitherto, none of the present members of the Society would live to see it completed, and when it would be completed the earlier portions of it would be found to be out of date. He thought it was a disgrace that the Government of the country had not provided funds to complete this great national work within a reasonable time.

**THE ABERDEEN AND GLASGOW MEETINGS.**—Mr MURRAY of Dollerie read the resolu-



tions adopted by the meetings of members held last autumn at Aberdeen and Glasgow, pointing out several ways in which, in the opinion of those meetings, the benefits of the Society might be extended, as also the detailed replies of the Directors to the different proposals.

The Director's proceedings in these matters were approved of.

**HUMANE TREATMENT OF ANIMALS.**—Mr CAMPBELL SWINTON of Kimmerghame stated that in February last the Baroness Burdett Coutts made some suggestions to the Directors as to the Society exerting its influence for the promotion of the humane treatment of animals. Her Ladyship's letter was referred to special committees, and these committees afterwards reported, when the Directors agreed that to the medals in aid of premiums given by local societies there should, as already reported, be added a class for men in charge of stock, and one for women having charge of dairies and poultry. The Directors had also under consideration the subject of aiding the cause of humane education, and circulars were sent out on the 31st March to above 970 school-boards in Scotland. It was gratifying to know that all the answers received stated that the subject had been favourably entertained by the school boards; and he could personally state that that was the case in several school boards to which the circulars had been addressed. These boards looked upon this as a matter of great interest and importance.

Mr MURRAY of Dolerie stated that he could say the same thing. The circular had been very favourably considered by the school boards with which he was connected.

The report was approved of.

**INVERNESS SHOW.**—Mr GILLON of Wallhouse reported that the arrangements for the General Show to be held at Inverness from the 28th to the 31st of July were in a satisfactory state of advancement, and that there was every promise of a most successful meeting.

**Entries.**—The entries closed on the 13th, and the following is an abstract of the head of stock and implements contrasted with those of the last show at Inverness in 1865:—

	1874.	1865.
Cattle, . . . . .	391	361
Horses, . . . . .	175	132
Sheep, . . . . .	422	812
Goats, . . . . .	1	—
Swine, . . . . .	48	43
Poultry, . . . . .	450	294
Collie Dogs, . . . . .	12	10
	1499	1652
Implements, . . . . .	1161	707

**Contracts.**—The contract for the erection of the yard is in the hands of Mr Matthew Richardson of Annan, who has done the same work on three previous occasions. The other contracts, such as the supply of refreshments in the yard, are in progress. The head-quarters of the Society will be at the Caledonian Hotel. The President's dinner is fixed for Wednesday, 20th July.

**Railway Arrangements.**—The Caledonian, North British, and Glasgow and South-Western Railway Companies are not, on this occasion, to take back free any stock or implements which may remain unsold, but they are to charge one-half the ordinary fare. The Secretary entreated the managers to reconsider their determination, but he regretted to say that the Directors of the respective companies adhere to their decision. On the other hand, the Highland and Great North of Scotland Railway Companies have kindly granted a free return for unsold stock and implements as formerly. The Highland Railway Company are forming a loading bank within 300 yards of the yard, so as to enable the stock to be taken to the showyard without passing through the town, and their arrangements for the conveyance of visitors is to be as liberal as possible.

**Committee of Superintendence—Inverness-shire.**—The Earl of Seafield, or in his absence Major Grant, Drumbuie, Glen Urquhart; Colonel Fraser Tytler of Aldowrie, Inverness; Colonel H. Inglis of Kingsmills, Inverness; Evan Baillie of Dochfour, Inverness, or in his absence James Mollison, Dochgarroch Lodge, Inverness; Alexander Aeneas Mackintosh of Mackintosh, Moy Hall, Inverness, or in his absence John Sinclair, his factor; Captain John Fraser of Balmain, Farraline, Gorthlick; Aeneas W. Mackintosh of Raigmore, Inverness; Aeneas Mackintosh of Daviot, Inverness; Arthur Forbes of Culloden, Inverness, or in his absence Duncan Forbes, Culloden House; Hugh Fraser, Balloch, Inverness; John Cran, Kirkton, Inverness; John Peter, Croyard, Beauly; William Cruickshank, Milton of Petty, Fort-George; Donald C. Cameron, Kerrowgair, Fort-George Station. **Elginshire.**—The Viscount Macduff, M.P., 4 Cavendish Square, London, W.; Hugh Maclean of Westfield, Elgin; James Geddes, Orbiston, Fochabers; John Ferguson, Secretary to the Morayshire Farmers'

Club; Thomas Yool, Coulardbank, Elgin; R. H. Harris, Earnhill, Forres; Robert Bruce, Newton of Struthers, Forres; Alexander Lawson, Braelossie, Elgin. *Nairn-shire*.—J. C. J. Brodie of Leithen, Coulmony, Dunphail Station, Forres; William Alexander Stables, Cawdor Castle, Nairn; Robert Anderson of Lochdu, Nairn; James M'Pherson, Clunas, Cawdor. *Ross-shire*.—Kenneth Murray of Geanies, Fearn; John Forsyth, factor for Balnagowan, Bellevue, Parkhill; Major Davidson, yr. of Tulloch, Inverbroom, Lochbroom; Captain Warrand, Ryefield, Ferrintosh, Dingwall; John Douglas, Calrossie, Fearn; George Middleton, Cornton, Ferrintosh, Dingwall; Walter Arras, Fodderty, Dingwall; Peter Robertson, Achilty, Dingwall. *Cromartys-hire*.—John Scott, Newton; George Begg, Mains of Cromarty; A. A. Middleton, Rose Farm; James A. Gordon, Udale. *Caithness-shire*.—Alexander Henderson of Stemster, Halkirk Road; Major James Horne of Strikoke, Wick; Major James Smith of Olrig, Thurso; Thomas Adam of Lynegar, Wick; Donald Mackay, Trail Street, Thurso; James Purves, Lochend, Thurso; John Millar, Thurster, Wick; James Hay, Scrabster, Thurso. *Sutherlandshire*.—Evan Charles Sutherland Walker of Skibo, Dornoch; Sidney Hadwen of Balblair, West Girty; Evander M'iver, Scourie, factor for his Grace the Duke of Sutherland; William Houston, Kinttradwell, Golspie; Andrew Hall, Blairish, Golspie; William Mitchell, Pulrossie, Dornoch; Robert Paterson, Bighouse, Thurso; John Scobie, Loch Inver, Golspie. *Orkney and Shetland*.—Andrew Umphray of Reawick, Lerwick; John Bruce, yr. of Sumburgh, Lerwick. *Town of Inverness*.—Colin Lyon Mackenzie of St Martins, Provost of Inverness; Alexander Simpson, senior magistrate; Alexander Macbean, one of the magistrates; Peter Baillie, one of the magistrates; William M'Intosh, Inshes House; James Rose, wine merchant; Huntly Fraser, Kinmylies; Donald Davidson, Drummond Park.

The following sub-committees have been appointed:—*Admission of Stock*.—Messrs Cran, Kirkton; Douglas, Calrossie; and Mollison, Dochgarroch. *Admission of Public*.—Messrs Duncan Forbes, Culloden House; Davidson of Tulloch, Baillie Simpson, Captain Warrand, and Mr Arras, Fodderty. Mr D. Forbes, convener. *Banquet*.—The Master of Lovat, convener. Mr Davidson of Tulloch, Earl of Seafield, Messrs Mackintosh of Daviot, Brodie of Lethen, and Harris, Earnhill. *Ball*.—Messrs White, Monar; Mackintosh of Raigmore; the Master of Lovat, Mr Davidson of Tulloch; Lord Macduff, Captain Warrand, Mr Brodie of Lethen; Provost Lyon Mackenzie, Major Horne, Strikoke. The Master of Lovat, convener. *Forage Yard*.—Messrs Anderson, Lochdu; Fraser, Balloch; and Cruickshank, Milton. Mr Fraser, convener. *Police*.—Sheriff Blair, Inverness; Baillie Simpson, Colonel Fraser Tytler, Sir K. Mackenzie, Bart.; Sir Archibald Dunbar, Bart.; Messrs W. A. Stables, Cawdor Castle; M'Intosh, Inshes House; and Davidson of Tulloch. *Accommodation of Strangers*.—Mr M'Intosh, Inshes House; Baillie Baillie, Inverness; Provost Lyon Mackenzie; Messrs James Rose, wine merchant; and James Anderson, solicitor.

*Tickets of Admission*.—Tickets of admission have been sent to all members residing in the counties embraced in the district of the Show, so far as known; and others will be supplied on application at the office in Edinburgh, or by letter addressed to the Secretary, before the 22d of July.

*Attendants in Charge of Stock*.—There is to be a refreshment-room set apart entirely for the use of those in charge of stock, and a portion of the shedding will be set aside for their night accommodation. Those exhibitors requiring such for their attendants will require to apply to the Secretary before the 30th of June.

GLASGOW SHOW, 1875.—Mr GILLON of Wallhouse then said, the arrangements for the show to be held at Glasgow next summer had been commenced in a most satisfactory manner. The Magistrates and Town Council have agreed to allow the Society the use of the Green, and they have also voted a sum of L.200 towards the funds. The Commissioners of Supply for the county of Ayr have agreed to raise by voluntary assessment the sum of L.350, while those of the county of Bute have resolved to levy a voluntary assessment of one farthing per pound.

AGRICULTURAL EDUCATION.—Previous to the reports on this subject being given in, The CHAIRMAN said that he wished to make a few remarks. It was always best to tell the truth, and he confessed he was a little sorry to have to say that the Directors could not come to one mind regarding agricultural education and the chemical department. He therefore hoped that they would not be too hurried in coming to any decision on the matter. The fact was that the public generally thought that the Highland Society were rolling in wealth; and the true state of the case was that they had very little wealth. From a statement which they might hear by-and-bye from the chairman of the Finance Committee, they had only L.550 at their disposal as a surplus to spend in any way. That was all that there was to spend in promoting either agricultural education or in paying the expenses of the chemist. Now, agricultural education was so very much mixed up with the chemical department, that he wished to state these things before they entered upon the discussion of the subjects connected with the educational department and to show that they must not be too hurried in coming to any decision regarding even what they as Directors had propose<sup>d</sup>. The

meeting would hear in a short time that it was proposed to give bursaries, to encourage agricultural education, but that was agreed to at a time before the Directors had a clear understanding about their finances. They decided to give as much as L.300 a year in bursaries, and it was very doubtful now whether that could be carried out. He wished to make these remarks, so that in the discussion which would subsequently take place, nothing, as he had said, should be hurriedly done. It was quite a mistake for the public to think that the Highland Society was so wealthy. Their expenses had enormously increased within the last few years. A great deal was said about the small premiums and paltry medals which they provided. These were all now largely increased, and instead of having money at their disposal, they would have hard work to make ends meet at the end of this year. With these remarks, he called upon Professor Balfour for his report on agricultural education.

Professor BALFOUR reported that the annual examination of candidates for the diploma and certificate in agriculture granted by the Society took place on the 24th and 25th of March when the following gentlemen passed:—For diploma—Forbes Burn, Hardacres, Berwickshire, who obtained the certificate in 1872; for certificate and diploma—Henry Erskine, Dalladies, Brechin, and Richard Henderson, Coldstream; for certificate—William Kennedy, 89 Marine Parade, Brighton, who is, in terms of the bye-laws, entitled to present himself next year for the diploma. It was stated that the prizes given by the Society to the class of agriculture in the Edinburgh University had this year been awarded by Professor Wilson to John Bramwell, Blackaddie, Sanquhar, and Robert W. E. Murray, Housebyres, Galashiels. The papers of these two gentlemen being of equal merit, the amount, L.10, was divided equally.

Mr MENZIES then read the following report by the Council:—The Council on Education having received the report of their sub-committee adopted it as follows:—1. That the Society should establish ten bursaries of L.20 each and ten of L.10 each—at schools, to be approved of by the Directors, which include or are willing to introduce the teaching of chemistry, and the following branches of natural science, physical geography, botany, and geology, into their curriculum. 2. That the bursaries should be determined by examination in the usual manner by the Society's examiners. 3. That the L.20 bursaries should be tenable for one year at the Universities, for the purpose of enabling the holders to take the classes necessary to qualify for the Society's certificate or diploma; and the L.10 bursaries to be tenable for the same period, to enable the holders to receive another year's preparation at school. 4. That the age of candidates for the bursaries at the Universities should be not less than 17, and at schools not less than 16 years. 5. That the present scheme of the Society's examinations should be modified so as to admit of a lower award, or second-class certificate. 6. That the awards in future should consist of a diploma; first-class certificate and second-class certificate. 7. That the examination for the second-class certificate should comprise the principle and practice of agriculture, agricultural chemistry, surveying and farm engineering, and farm accounts. The examination for the first-class certificate should include the compulsory subjects of the second-class certificate, and any three of the following optional subjects—botany, geology, physics or mechanics, meteorology or climate, natural history, and veterinary practice; and that the examination for the diploma should remain as at present. 8. That a standing acting committee of the council on agricultural education should be appointed by the Directors.

The CHAIRMAN said he hoped the meeting quite clearly understood that the L.300 which the Council of Education proposed to give annually must be paid out of the sum of L.550 which he had said was available. It was mentioned on page 11 of the premim list, clause viii.—“That a sum not exceeding L.100 per annum shall be placed at the disposal of the examiners, to be applied in prizes to candidates who pass with distinguished merit, and on a standard exceeding that required for the diploma.” He might explain that that sum had also to be taken out of the L.550.

Mr WALKER of Bowland suggested that it might be convenient to the members of the Society who were not generally conversant with the subject, that this report should be passed from, and that the discussion should take place after they had heard the reports on both subjects.

This was approved of, and the reports were then called for in connection with

THE CHEMICAL DEPARTMENT.—Sir THOMAS BUCHAN HEPBURN of Smeaton, Bart., read the following resolution:—“That the Highland and Agricultural Society accepts with regret Professor Anderson's resignation of the appointment of chemist to the society, which he has held since 1849. That the society convey to Dr Anderson its expression of deep regret that the state of his health has compelled him to abandon his important duties both in the Society and in the University of Glasgow. That the Society in the fullest manner recognises the importance of the services which Dr Anderson has rendered to the science of chemistry by his original researches, and to the Highland Society's chemical department by the fidelity and accuracy of the work executed on its behalf by him. That the Society convey to Dr Anderson its cordial wishes for the enjoyment of ease and comfort in the retirement which the state of his health

has compelled him to seek. That the above resolutions be recorded in the minutes of the Society, and that an extract thereof be communicated to Dr Anderson by the Secretary." The resolution was unanimously adopted.

Professor Dewar read the following report :—

"CHEMICAL LABORATORY, CLYDE STREET HALL,  
June 16, 1874.

"During the past six months, the work of the chemical department has been greatly increased. The substances analysed have included simple and compound manures, guanos, potable waters, refuse substances, and stomachs of animals suspected to have died from the action of poisons. No grave cases of adulteration have come under my observation, and I believe the plan now adopted by many agriculturists of buying the essential ingredients of plant food, and mixing them according to the requirements of the soil and the crop, is tending greatly to diminish the system of vending defective manures. At the same time that this plain of applying manures is most advantageous to the farmer, it is more satisfactory to the Society's chemist, as he can recommend the mixture that ought (as far as experiments have been made) to be likely to yield good results. Further, the adoption of this course by the farmers generally would greatly diminish the difficulties that are apt to arise in the estimation of the values of complex manures, and also to shorten the time and labour of the analytical processes. I have learned from various agriculturists that a feeling exists, that the fees for analyses are in some cases too high, and that something ought to be done to lower them. This, I believe, may be effected through the Society favouring the prosecution of original investigations in the laboratory; so that well-educated young men might be induced, from the quality of the scientific instruction they would receive, to become, after some time, useful assistants in the discharge of the Society's work."

The CHAIRMAN then stated that, from what he had already said, he dared say that the meeting did not expect that any report should now be brought forward. They had had a great many proposals before them, which were all on the table; but if it was thought necessary, they could all be read. To do so would occupy a great deal of time; and perhaps the best plan would be to read the last proposal, which had been drawn up by a small committee.

Mr MENZIES read the report of the Sub-committee on the chemical department, which was in the following terms :—"The Secretary read a memorandum detailing the various schemes suggested for the re-adjustment of the chemical department, and the Chairman submitted a view of the income and expenditure of the Society. Your committee have considered the various proposals for the appointment of a chemist, and find the amounts proposed to be more than the Society can afford. From the financial statement, your committee find that no greater sum than L.550 is available for the schemes suggested, both chemical and educational. This sum is made up as follows :—1. Professor Anderson's salary, L.300; 2. Professor Dewar's salary, L.150; 3. Vote to Chair of Cattle Pathology, which has expired, L.100—total, L.550. Your committee therefore recommend the appointment of a chemist at a salary of, say, L.500 a year, who shall be restricted from making analyses for manufacturers of manures, feeding stuffs, and other substances, for the purpose of trade advertisements. With reference to his general duties in carrying on field experiments, analyses, original investigations in agricultural chemistry, &c., it should be referred to the Chemical Committee to draw up regulations, stating what assistance he should be provided with. The chemist to be entitled to the fees for analyses, and to be at the entire expense of keeping up a laboratory."

Mr MURRAY GRAHAM of Murrayshall stated that before the more important discussion commenced on the reports they had just heard, he might perhaps be permitted to say a word with reference to a request made to him by several agriculturists in the neighbourhood of Perth as regarded the inspection of their purchases of artificial manures. The use of these had increased very much of late, and the agriculturists to whom he had referred found that the chemist in Edinburgh was hardly enough, so far as their convenience went, for the whole work. They would much desire to have trustworthy men appointed in the central towns in which the various shows of the Society were held, to whom they could have recourse. They might appoint a chemist of their own by subscription, but from various circumstances which had occurred recently, they were much more desirous that the matter should be left in the hands of the Society. The long purses and fees given by agricultural companies had rather an injurious effect as compared with the smaller resources of the farmers.

Mr MELVIN, Bonnington, asked the chairman if he could give any information as to the amount of money funded yearly by the Society?

The CHAIRMAN—Mr Murray of Dolerie will give you the information.

Mr MURRAY stated that several years ago they were able to fund some money, but in consequence of the expressed desire of the members to enlarge their expenses, they for the last two or three years had funded nothing. It was perfectly true that they had, by desire of the Society, invested L.1500 for what was called the Building Fund, it

being the desire of many to remove from their present building to another. Nothing, however, had been added to it since last year.

Mr HOPE of Bordlands—I understand that by the charter the Highland Society is bound to fund a portion of the life payments.

Mr MURRAY—The Directors have given that the go-bye, and we have not funded any at all this year.

Mr HUNTER of Blackness stated that in one of the last reports he found that the funds of the Society were something like L.56,000. He thought the Society was too rich already, because it was getting quite independent of public opinion. Lord Kinnaird lately wrote a letter in which he stated that the expenses were something like L.1500, and that statement was never corrected. He thought that a statement of the accounts should be presented to every member of the Society twice in the year.

Mr MURRAY—The accounts are presented annually at the January meetings of the Society. I hold copies of these in my hands.

Mr HARVEY, Whittingham Mains, thought they must get on to business. They had been a long time at this chemical department. They had already the services of Mr Dewar, who had read a very able paper, and, in the meantime, he thought the best course for them to adopt was to instruct the Secretary to advertise for a first-class chemist at a salary of not less than L.500 a year. He remarked that it was very heartless to see so few farmers present. He thought, from what he heard out of doors, that greater interest would have been taken in this appointment. The chemist they appointed might analyse what the members sent to him, and keep a register; and, if necessary, an increase might be given to the L.500. Who was the great ornament of the English Society but Dr Voelcker? He thought that if the Scotch Society were to get such a man it would resuscitate its energies, and add to its popularity. Out of doors they heard nothing but dependency, and that they were going on like a lot of old wives. He had been told that a hundred times. They ought to have the best chemist for agricultural purposes in Europe if possible, and they could get that if they took the proper means of doing so.

Mr MELVIN thought that before they went further the report of the Chemical Committee should be read. They had had several meetings.

The CHAIRMAN—They are all here, but are very long.

Mr MELVIN—The proceedings were very lengthy, but the report is short.

Mr MILNE HOME of Wedderburn said that they had before the meeting two documents, one of which recommended certain bursaries to be approved of by the Society. The other document was not a report from the Directors at all. It was a report from a sub-committee with regard to the chemical department; and it appeared from the statement that there were only two gentlemen who attended on that occasion, and drew out this report.

The SECRETARY—They were all present.

Mr MILNE HOME—There were three—Mr Murray, Sir Thomas Hepburn, and Mr Walker.

Mr WALKER of Bowland—Allow me to correct a misapprehension. The sub-committee were present at a meeting at which the whole subject was fully discussed. They were appointed to draw up a report for the information of this meeting on the resolution which the Chemical Committee, or rather the Directors, after hearing the report of the Chemical Committee, had come to. Therefore the conclusions in that report are not the conclusions of the sub-committee, but an embodiment of the conclusions of a larger meeting.

Mr MILNE HOME said he was still right that the Directors had not approved of the report of the sub-committee, and they had only that report as to the appointment of a chemist. It also appeared that L.550 was all that was available both for the chemical and educational departments. They had a report from the Council, at which the Lord Justice-General, Chancellor of the University of Edinburgh, presided, and approved of by the Directors, submitted to this meeting, and therefore they had a distinct and definite plan with reference to the educational question, while they had only that short report in regard to the chemical one. They had now considered the suggestion of Mr Walker of Bowland, that it was desirable that the meeting should go into the educational question and the chemical question together, or whether the whole of these questions were to be shelved and delayed for consideration. It would be an unfortunate thing if they were not to come to some resolution on these questions at this meeting. They had spent six months in considering them, and both of them had undergone great consideration by the Directors, who had, especially on the educational one, the benefit of the assistance of the Council on Education. He begged leave to say that twenty-five years ago the Society considered the matter of such importance that they were at the expense of going to the Crown and getting a charter to enable them to commence the work of agricultural education. They felt that it was of great importance that the farmers who raised stock and used implements should have the knowledge to enable them to use these implements and raise that

stock; and they understood that a knowledge of science, mechanics, chemistry, and so forth was necessary to carry on agriculture on a proper footing. He did not approve of the method which the Society at that time adopted for communicating agricultural science. What they said was this—"We will grant a diploma and also a certificate to any one who will stand a difficult examination in chemistry and other branches." What had been the result during the last twenty-five years? How many gentlemen did they think had gained the diploma of those who had been induced to go on with the subject of agricultural instruction? According to a blue-book published the other day, the whole number was just twenty-six, or about one individual for each year during the time that this Society had had its charter. That of itself would show how insufficient the means were which the Directors had adopted for agricultural instruction. Then, if they looked at the names of these twenty-six persons, they found that twenty-three of them obtained their education in England. They got it at the College of Cirencester, and other places where such instruction was given. Only three Scotchmen had the instruction necessary for the diploma, and perhaps these gentlemen got their instruction in England also. If they asked the Professor of Agriculture whether he was satisfied or not with the means existing in this country for enabling young men to come to his classes, he stated that a large number of these young men were unable to understand his lectures, because they had not received the necessary instruction in chemistry and other branches. Therefore it was that this proposal had been brought forward to encourage agricultural education more in schools. This committee, with the Lord Justice-General at its head, recommended them to give bursaries to encourage young men to come to the agricultural classes in the universities, and to encourage middle-class schools to teach those branches necessary to prepare young farmers to come to the university for further instruction. They had ascertained that most of the schoolmasters throughout the country, not merely in the middle-class schools, but likewise in the primary schools, were quite ready to begin this if they were only encouraged to do so by resolutions passed by the Highland Society, inviting and encouraging them to give that instruction. Colonel Innes of Learney, who was present, would tell them that in Aberdeenshire there was a large number of schools where chemistry was being taught; and he (Mr Milne Home) had personal knowledge that there were seven or eight middle-class schools, such as Dollar Institution, prepared to give such instruction if the scheme of the Directors was adopted. The bursaries were of two classes—L.20 and L.10. The former were for those able to attend the university classes—those who showed such knowledge and proficiency in the middle-class schools as to be able to understand Professor Wilson's lectures; and the L.10 bursaries were for those not quite up to the mark, but sufficiently up in it as to show that they were making fair progress. They were to receive these to enable them to continue their education in these middle-class schools. Here, therefore, was a distinct and intelligible plan—the plan adopted by the Royal English Agricultural Society, who had set aside L.500 a year for bursaries, in order to encourage young men to attend the middle-class schools or the colleges in England, Scotland, or Ireland. The people of England saw and acknowledged the necessity of encouraging agricultural instruction; and now, when circumstances required more scientific education than thirty or forty years ago—education implying a knowledge of chemistry, mechanics, and things of that kind—would it be said that the Highland Society felt so little interest in encouraging this as to let it go to the ground, and that having a charter, it was not to do anything to put itself on a right footing? Their past efforts had been an entire failure, and had not encouraged that education in Scotland that it was desirable to encourage. When they had this definite plan and this L.550 of surplus, they had the means of encouraging that most important object, and they should approve of what was laid upon the table by the Directors. In concluding, Mr Milne Home said it was ridiculous to suppose that a chemist could be obtained and his laboratory kept up for L.550 a year. The Finance Committee made a very important suggestion to the Directors. At present they spent L.440 a year in giving gratuitous copies of the Transactions to all the members of the Society. He thought that that was unnecessary. Let those who wished to read the Transactions pay their 4s. or 5s. for the Transactions, and then the Society would be in funds. He moved that the Education Council's report be adopted, and the chemical matter remitted back again to the Directors for further consideration.

Mr HANDSIDE of Cornhill said he thought that the meeting might have received from the Directors a little more than a bundle of reports, and that it would have been far better if matters had been brought before them in a more adjusted manner. In regard to the two proposals, he thought they were bound to do something for those who had borne the brunt of the matter, and that perhaps the best thing, in the first place, was to look after the chemical department. He did not think that the farmers reposed that confidence in the chemical department which they ought to do, but the Directors should see that it was made a real advantage to the members.

The CHAIRMAN said that the Directors were divided in opinion in regard to the chemical department, and that was where the difficulty lay. If they could have come

to a decision as to what was best for the members, no doubt there would have been a report.

Mr HOPE said he agreed with almost all that Mr Milne Home had said. He was most anxious for the education of the young, but the benefit of the farmers was also most important. He would second the motion that it be remitted to the Directors to appoint a chemist at as high a salary as possible. They could not get a first-rate chemist for the money; but if they went to Germany, from which Dr Voelcker came, he had no doubt they would get a very good man.

Mr GOODLET, Bolshan, seconded Mr Milne Home's motion. It was stated that there was a sum of only L.550 at disposal. Now, he thought that, in order to make a thorough inquiry into the state of the funds, they would require to go deeper into it than the length they seemed to have gone. There were many outlays on the part of the Society which might be turned to proper account; and he believed if a committee were to go over the expenditure of the Society, instead of L.550 they would get a couple of thousands of pounds. If they got that sum, then they would be enabled to adopt Mr Harvey's proposal as to the appointment of a chemist, and also Mr Milne Home's as to education. Both things were necessary. It was necessary that they should have a chemist employed solely by the farmers, so that there would be no suspicion in regard to him as there might be regarding one employed by those who sold manures. It surprised him to hear that the Society was poverty-struck, whose funds amounted to L.56,000. If the Society had such a large sum of money, surely it would be possible to give a thousand or two to carry out the two proposals. He thought it would be well that there should be an examination of the books to see what really could be saved out of the present expense. Mr Milne Home had spoken about the expense of supplying the Transactions to the members. He himself had read them, and he thought there was an immense mass of rubbish published. Then he thought they might save a good deal of money that was now given towards local societies, as he thought that these local societies should raise sufficient money for their own purposes. Then there was money that might be saved from premiums given for essays that were not worth it. They gave out subjects which, if properly written about, would require a high education. They had really no results from these essays, or if there were any results, they were not worth having. He hoped that an inquiry would be made, so as to let them see whether they could not save more money than the paltry L.550.

Mr MELVIN said that if Mr Goodlet would propose a resolution to investigate the expenditure of the Society, he would second the motion. He would like neither to oppose Mr Milne Home's motion nor to curb and weaken the proposal to appoint a chemist. If they voted in favour of Mr Milne Home's motion without knowing what funds there were, they might not be able to appoint a chemist, which would be a pity. The question of education was the thing that many years ago broke up the chemical association. He thought it would be extremely desirable that a motion such as that proposed by Mr Goodlet should be made, and that both questions should be postponed till there was a report from the committee, which should consist of several influential persons, of whom some should be farmers.

Mr WALKER of Bowland said he entirely agreed with what Mr Melvin had said, and the light in which the matter had occurred to that gentleman showed the reason why the Directors did not come forward with a more distinct statement. The difficulties he felt were those which the Directors had to encounter, and could not overcome. They had received from the Convener of the Finance Committee a statement of their income and expenditure. They found that the present expenditure of the Society, including the L.550, amounted to L.4022, while the average income of the Society, on an average of five years, amounted to L.4081. Now, it was out of the power of the Directors to increase the expenditure for education or the chemistry department. Various suggestions had been made. The Directors had no power to alter the destination of the funded money. It must be done under the rules of the charter, which required due notice and the sanction of certain meetings. Another proposition was made with regard to the publication of the Transactions, which cost L.445. It was thought that that expense might be diminished, or altogether abandoned. Now, the arrangement as to the Transactions was agreed to by a distinct expression at a meeting that the system of selling the reports should be given up, and so it was not in the power of the Directors to alter it. It was under these circumstances that it was proposed that a chemist should be appointed, who should devote his whole time to the Society, and keep up a laboratory—the estimated expense of which would be about L.1200, while the Committee on Education recommend a grant of L.300. The Directors could not recommend any one of these schemes.

A MEMBER.—They did.

Mr WALKER.—They proposed one involving a cost of L.550. These were organic changes, and he thought they should be carefully considered, and not entered into rashly. If they involved themselves either in pecuniary difficulties or in a system that was not thoroughly satisfactory, they would have very great difficulty in afterwards getting out

of it. The moment they diminished their capital sum, the more their annual income would be diminished; and he thought if they retained the other objects of the Society, they should be very careful not to reduce the capital sum. It had arisen to a large extent from life subscriptions, and that ought to be divided over a number of years.

Mr HOPE—But if you have got a capital of L.56,000?

Mr WALKER—We are not accumulating now.

Mr SCOT SKIRVING said he thought it would clear the way so far if they were to come to a conclusion whether they would have one first-rate chemist or a number of young men. There was a gentleman present from Perthshire who said they did not want one man in Edinburgh or Glasgow, but half a dozen men.

Sir THOMAS BUCHAN HEPBURN said he thought that a special meeting should be called for the purpose of considering the various proposals, as a number of the members were not aware of the nature of them.

Mr HARVEY, Whittingham Mains, said they could not do otherwise than appoint a first-class chemist. He was equally anxious to see the young instructed. He never opposed that; but they must commence with the appointment of a chemist. After the chemist was appointed, he thought it would be advisable then to see what he (the chemist) would recommend to be done with the money at the command of the Society. He proposed that they should advertise for a chemist; but he wished it to be understood that he was not opposed to the education of the young. It was most important to instruct the young; but a number of those present, who were old fogies, wished to have some instruction also—to know what they were about, to know whether they were paying L.10 for what might be really worth only L.5. They must have a first-class chemist—a man of undoubted fame—a man who would consult with the farmers, and let them know what, in his opinion, was the most suitable mode of experimenting.

Mr ROUGHEAD, Haddington, said he considered it of the utmost importance to the Society to have a chemist. The whole thing was in a nutshell. They spent at present upwards of L.400. In Germany there were the first-class chemists of the day; and he believed if they were to advertise for a German chemist, they would get a young man for L.600 or L.700 a year. He had no doubt that a young energetic chemist coming here would get pupils, and instruct the young farmers and the general public. He thought it was of importance that they should have a young man devoted to the purposes of the Society—to see that the farmer got the manures genuine; and not only that, but to explain what were the best manures to apply to the soil. It would have the effect of allowing the tenantry to come in contact with the chemist, and have conversations with him, which would be of great advantage, both to the farmers as well as the proprietors of the soil. Farmers had done much in regard to the rearing of stock, but they ought not only to pay attention to that department but also to the cereals of the country, and to get chemistry applied to make them more productive. He thought that that was more important than the education of the young. The young ought to be taught in the schools; and to have a good chemist was of the greatest importance. It would make the Society more popular, and if not done the Society would lag behind as compared with the other societies in England and Ireland.

Mr SMITH, Whittingham Mains, said that while they were all agreed that both departments were important, it must be noticed that if the motion for the appointment of a chemist was carried, the other matter in regard to education would be shelved. Both subjects were so intimately connected, that he thought it was much better for the Society and for all parties that the one should not be lost sight of for the other.

Mr MILNE HOME said he had no objection to allow the educational question to lie over along with the other. The Society could suffer no prejudice, because they had heard a very able report from Mr Dewar, who was Dr Anderson's assistant. He did not know a more able chemist than Mr Dewar in the country, and he thought they could well allow that gentleman another six months.

Mr ROUGHEAD said he had no doubt of Mr Dewar's abilities, but probably they would get a young man to act at a much lower rate than that for which they could expect Mr Dewar to perform the duties.

Mr ANDERSON of Inchyra Grange, said he thought there was a very strong desire that both questions should be disposed of in a satisfactory manner. The difficulty had been a difficulty in regard to funds. Mr Walker said that the Directors had no right to change the destination of the funds. But he thought that, after the strong expression of the opinion of parties, either as regarded the chemistry or the education question, it would have the effect on the Directors of leading them to consider the question whether they could not devise the expenditure of the Society so as to allow a sum for both these things. Let them revise the whole of the accounts, and see whether they could not, at another meeting, arrange by which both these objects might be carried on.



Professor BALFOUR said he did not see why they should go to Germany for a cheap chemist. It was ridiculous to suppose that they would get a chemist and a laboratory kept up for L.550. He agreed with the proposal that the matter ought to be delayed.

Mr MELVIN moved—"That the meeting ask the Directors to appoint a committee of their own number and others to investigate the income and outlay of the Society, and to endeavour to provide sufficient funds for the purposes of the chemistry department and education. Delay consideration of these subjects in the meantime."

Mr WALKER of Bowland seconded the motion.

The CHAIRMAN—Perhaps Mr Harvey and Mr Milne Home will withdraw their motions.

Mr MILNE HOME said he would withdraw his motion in favour of that which was now proposed.

Mr HARVEY said he would withdraw his motion at once. He thought the Chairman should dismiss them, as they could not agree to anything. When he was a Director they generally agreed about everything. There was no pleasure in doing anything connected with the Directory.

Mr MELVIN said there was one remark he would like to make, and that was, that he hoped the Directors would early consider the matter, so that they would be prepared to report to the first General Meeting of the Society, so that the matter could be decided at once.

The CHAIRMAN said he was sure that the Directors would take up the matter at once.

Mr HARVEY said he had great respect for Mr Dewar, whose report was admirable, so far as he had been engaged. He would not say anything against Mr Dewar. Perhaps he might be the chosen man after advertising, and in that case they would have no cheap Germans, as Professor Balfour said. There were many cantankerous men among the Directors, and this meeting seemed not less so.

The CHAIRMAN said it was quite understood that everything connected with the educational and chemistry departments was deferred for the present.

The Hon. GEORGE WALDEGRAVE LESLIE—Except that Mr Dewar is retained.

The CHAIRMAN—Yes; he has got an appointment.

Mr Melvin's motion was then agreed to.

MEMORIAL TO COMMITTEE OF PRIVY COUNCIL—TEXT-BOOK—Colonel INNES of Learney said he had made a proposal that the Privy Council, as representing the Department of Science and Art, should take up the subject of agriculture as well as other subjects that were to be taught in the primary schools. The Directors unanimously came to a resolution approving of his proposal, and as it involved no difficulty as to expense, he trusted it would now be submitted for the approval of the meeting, and that the memorial be forwarded to Government. Mr Milne Home's proposal was to obtain bursaries for students in primary and secondary schools, to enable them to pursue a higher education in agriculture in the universities. His (Colonel Innes') proposal was a very modest one. It was to the effect that whereas the practice of agriculture now involved the application of science, it was necessary that instruction in the application of science to agriculture should be diffused generally among all classes of agriculturists, and that that could be done by that education beginning in the primary schools. It would be out of the question for the Society to operate on the primary schools; but in the Science and Art Department there was the whole organisation; and if they got the consent of the Privy Council to take up agriculture as one of their branches, it would open to the humblest agriculturist the means of getting information as to the application of science to agriculture. The following was the resolution adopted by the Directors:—" (1.) That the Society memorialise the Committee of the Privy Council on Education on the propriety of establishing agriculture as a branch of the system of physical science taught under the superintendence of the Department of Science and Art in the schools and classes. (2.) That the Society offer a premium for the best text-book for such a course, including the application of botany, geology, chemistry, and animal physiology to the art of agriculture and the management of farm stock." He held in his hand, when he made the proposal, a letter from a schoolmaster in the county of Aberdeen, who occupied the position of chairman of the Association of Schoolmasters in three of the northern districts. It stated that 150 schoolmasters were ready to undertake that branch of education. Therefore, when they had such a complete organisation ready to enable the people to acquire a knowledge of the application of science to agriculture, it seemed to him that there could be no hesitation whatever as to the adoption of the proposal. Although there might be doubts as to the application of thousands a year, there could be no doubt as to the small expense necessary to carry out such a scheme as he proposed. He moved that the resolution adopted by the Board of Directors be carried.

Mr MILNE HOME seconded the motion. He said there was no discrepancy between Colonel Innes and himself in regard to the matter. This proposal was, with the view of securing not merely to primary schools, but to other schools, those liberal grants

given in cases in which certain sciences were taught. There were at present 119 schools which were drawing grants from the Kensington Department for chemistry, botany, and other branches; but it appeared that the chemistry that was taught was not in relation to agriculture, but manufactures, and what the teachers wished was to have it extended to agriculture. They were prepared to give it their hearty support, provided that agricultural chemistry be adopted by the Science and Art Departments. He wrote last week making inquiry into the subject, and the reply was that the grants were limited to other subjects than agriculture; but he had no doubt that as the object of that department was to educate the working classes of the country, they would be able to extend the grants to agriculture as well as to other subjects. At the same time, he did not confine his desire to the extension of grants to the primary schools. He had more reliance on the middle schools; and he believed that if the grants from Kensington were extended they would apply to all schools.

Professor BALFOUR said he thought that in regard to the elementary schools they did not want the practical application of science to agriculture. What they wanted in the elementary schools was to teach the elements of the sciences. There were no means of thoroughly testing the knowledge of the pupils in the elementary schools. In regard to the Kensington Department, the answers were sent to London, and the matter was decided there. But surely we in Scotland were able to carry on the work ourselves. Let them give a good practical education in the middle schools, and they might depend on it that the elementary education would follow in the primary schools. He was sure that as the higher education was being carried on well, the other departments would be well attended to without the Science and Art Department requiring to come in.

Mr MILNE HOME said he had no doubt that the examination could be carried on as well here as in London—perhaps better—but it was a fact that ought to be kept in view that 42 schools last year received L.1700.

The motion was then agreed to.

**VETERINARY DEPARTMENT.**—The CHAIRMAN reported that the annual examinations for the Society's veterinary certificate took place on 13th, 14th, and 15th of April. The examiners in the several departments were as follows:—*Anatomy and Physiology.*—Dr Dumbreck, Edinburgh; Dr Charles Dycer, Edinburgh; Thomas A. Dollar, V.S., London; C. Cunningham, V.S., Slaford. *Chemistry and Materia Medica.*—Professor D. MacLagan, Professor Balfour, Edinburgh; Finlay Dun, V.S., Weston Park; Dr W. Craig, Edinburgh. *Diseases of Horses.*—Thomas Taylor, M.R.C.V.S., Manchester; John Lawson, V.S., Manchester; John Borthwick, M.R.C.V.S., Kirkliston. *Diseases of Cattle, Sheep, Dogs, and Swine.*—John Steele, M.R.C.V.S., Biggar; William Aitken, M.R.C.V.S., Kilmarnock; A. Pottie, V.S., Paisley. *Practical Examination.*—T. A. Dollar V.S., New Bond Street, London, President of the Clinical Board; Thomas Taylor, M.R.C.V.S., Manchester; John Lawson, M.R.C.V.S., Manchester; Finlay Dun, V.S., Weston Park, Shipston-on-Stour, Warwickshire; John Steele, M.R.C.V.S., Biggar; John Borthwick, M.R.C.V.S., Kirkliston; C. Cunningham, V.S., Slaford. The following 33 students obtained the Society's Veterinary Certificate, out of 42 who presented themselves for examination:—Robert J. Bell, Eccleshall, Staffordshire; Thomas Dalling, Bathgate; A. H. Darwell, Northwich, Cheshire; John Hutton, Fintry; C. P. Lyman, Boston, U.S.; Edward Margaron, Stoke Ferry, Brandon; Duncan Marquis, Clyde Street, Glasgow; Alexander R. Scott, Wick; Thomas J. Simpson, Edinburgh; Duncan Turner, Thornliebank; William Anderson, Keith; E. A. E. Ashe, Cork; L. T. Barker, Skelton, Cleveland, Yorkshire; A. Burney Wren, Manchester; J. A. Bole, Castlebar; W. R. Bradshaw, Clonmell; John Corbett, Simonburn, Hexham; J. R. U. Dewar, Midmar; Edwin Faulkner, Manchester; G. H. Fenton, Doncaster; Thomas Flintoff, Deighton; William Gladstone, Yetholm; John Johnstone, Roslin; J. H. T. Kenyon, Manchester; Benjamin M'Innes, jun., Charleston, S.C., U.S.; R. W. Matthews, Alford, Lincolnshire; Henry Morris, Wick; Hugh O'Connor, Limerick; D. C. Pallin, Dublin; S. L. Ragg, Sheffield; P. E. Rothwell, Tottington; John M. Stewart, Edinburgh; M. T. Tracey, Ireland. The medals awarded to the students will be found at the end of the premiums awarded by the Society.

**STEAM CULTIVATION.**—The SECRETARY reported that an exhibition of steam cultivators was to be held under the auspices of the Society, in the vicinity of Edinburgh, early in the autumn of 1874. The exhibition would not be competitive, but each exhibitor would have the opportunity of showing the full working power of his apparatus.

The Hon. GEORGE WALDEGRAVE-LESLIE then moved—"That this meeting is of opinion that, considering the scarcity of labour, the uncertain state of the labour market, the high price of horses, and of horse fodder, the Highland and Agricultural Society should in every way encourage all attempts to introduce an improved system of steam cultivation at remunerative prices, and that the Directors be requested to assist the cause of steam cultivation by every means in their power." He said he

would not trouble the attention of the Society at any great length, but he could not help regretting that the Steam Committee had not adopted a fuller report with some remarks or information. Every one would be glad to know that an exhibition of steam cultivators would be held under the auspices of the Society in the vicinity of Edinburgh early this autumn. Steam cultivation was now a necessity. Farm horses were at a tremendous price, horse fodder was rising daily in value, and steam cultivation must be used, and every effort made, and every encouragement given to make it more easy of attainment, and less costly in operation. A few days ago he was enquiring in England of Mr Albert Pell, M.P. for North Leicestershire, and Mr Clare Read, M.P., for West Norfolk, who both agreed in stating, from their own knowledge as practical farmers, that steam cultivation could not be carried out at present prices at a less cost than 20s. an acre. He then referred to the Bath and West of England Show, at which, as stated in the *Times*' report, "no prizes are offered for agricultural implements, but the stands, furnished by all the best makers, and a number of firms of lower rate, occupy a length of nearly two miles." He then alluded to a meeting of a deputation who recently waited on the Board of Trade, at which the Duke of Sutherland referred to the fact that as labour was dear, there was the more reason for using mechanical appliances. He then alluded to several steam cultivation companies, and said that they had been doing their work exceedingly well.

Professor WILSON, in seconding the motion, said he thought it was the duty of the Directors to do all they could to promote steam cultivation.

The motion was adopted; and the proceedings then terminated.!

#### GENERAL MEETING, 20TH JANUARY 1875.

The MARQUIS OF LOTHIAN, and afterwards the DUKE OF BUCCLEUCH, K.G., in the Chair.

DECEASED MEMBERS.—The noble CHAIRMAN said—Before proceeding to the business on the programme, I have to advert to the severe loss the Society has sustained since the last anniversary meeting by the death of many old and influential members. Among these I may notice the late Duke of Montrose, who died while holding the office of Vice-President, and who acted as President during the four years from 1845 to 1849; the late Earl of Dalhousie, who served as a Vice-President in 1867 and 1868; Lord Colonsay, one of the most valued members of the Society's Council on Education; Dr Thomas Anderson, who held the office of chemist for twenty-five years; also the following old members of the Board:—Sir William Jardine of Applegarth, Bart.; Messrs Patrick Boyle of Shewalton, C. L. Cumming Bruce of Roseisle, Robert MacLachlan of MacLachlan, Alexander Morison of Bognie, and Richard Trotter of Mortonhall, as well as Mr George Brown, Westertown, who died while having a seat at the board; and lastly, Mr Henry Stephens, the author of "The Book of the Farm," who acted as editor of the Transactions from 1836 to 1853, as a member of Council on Education from 1865 to 1874, besides serving as an ordinary director, and on several important committees, and who at his death bequeathed to the Society twelve valuable pictures, painted and engraved for "The Book of the Farm," with the view of their being hung up in the Society's hall, as has now been done.

ELECTION OF MEMBERS.—Ninety-two gentlemen were balloted for and admitted as members.

ELECTION OF OFFICE-BEARERS.—The Secretary read the names of the office-bearers retiring by rotation, and stated that the Directors proposed in their place the following:—*Vice-Presidents*—His Grace the Duke of Hamilton, Most Noble the Marquis of Bute, Most Noble the Marquis of Lorne, M.P., Right Hon. the Earl of Glasgow. *Ordinary Directors*.—The Hon. Greville R. Vernon, Auchans House; Sir Alexander Jardine of Applegarth, Bart.; Robert Findlay of Springhill; Thomas D. Findlay of Easterhill; Charles Howatson of Dornel; James Johnstone of Bodesbeck; John M. Martin, yr. of Auchendennan; William S. Walker of Bowland. *Extraordinary Directors*.—The Hon. the Lord Provost of Glasgow; Sir Robert J. Milliken Napier of Milliken, Bart.; Sir Michael R. Shaw Stewart, of Blackhall, Bart.; Sir Thomas Edward Colebrooke of Crawford, Bart., M.P.; Sir Thomas Milles Riddell of Sunart, Bart.; Lt.-Col. Claud Alexander of Ballochmyle, M.P.; Colin G. Campbell of Stonefield; M. J. Bowden Fullarton, convener of Bute; James Hozier of Mauldslee; Graham Somerville of Sorn. *Council on Education*.—The Duke of Buccleuch, in place of the late Lord Colonsay; and James W. Hunter of Thurston, instead of the late Henry Stephens.

The CHAIRMAN having asked if the list was agreed to,

Mr BARCLAY, M.P., said that he felt, with regret, called upon to move an amendment to the list of office-bearers which had just been proposed from the Chair, by submitting that Mr M'Combie of Tillyfour, M.P., be elected one of the ordinary directors of the Highland Society. Before referring more particularly to the specialities of

Mr M'Combie's case, he wished to point out to the meeting that in the list of eight new ordinary directors, the whole of them were either proprietors or belonged to the proprietorial class, and there was not amongst them one gentleman who appeared to be generally recognised as a practical tenant-farmer. He thought that he expressed the feeling of the members present, and those who were absent, when he said that there was a general impression that there was not a sufficient number of gentlemen practically acquainted with agriculture on the directorate of the Society. He was sure that if they had several gentlemen practically acquainted with agriculture on the management, they should have a considerably greater degree of progress, and do more practical work for the benefit and improvement of agriculture, which, he was sure, all the Directors were willing to aid. In making this motion he did not propose any reflection whatever on the present Directors, but wished merely to state that the reason why he, and those whom he represented, had resolved to bring forward practical farmers was in order that there might be more practical observation and acquaintance with farming on the directorate than at present. That was a general proposal which was taken up and brought under the notice of the Directors by resolution from a large meeting of the members of the Society in Aberdeen some eighteen months ago, and again at the annual meeting of the Society in January last. In regard to the special case of Mr M'Combie, he wished to recall to the recollection of his Lordship in the Chair what he was pleased to state last year, viz., that when a telegram was received announcing Mr Barclay's intention to move that Mr M'Combie should sit on the Board, if there had been the possibility of doing so the Board would at once have agreed to the suggestion. His Lordship afterwards explained the difficulty in the way through the names of the Directors who were to be nominated having been advertised. He (Mr Barclay) was then led to the conclusion that they had as much as a promise that Mr M'Combie would be appointed this year. He was sure that, although his motion in favour of Mr M'Combie was not carried last year, a good many abstained from voting for the amendment seeing the somewhat awkward position in which the Directors were placed; and he thought, with all deference, that the Directors had no excuse on this occasion for Mr M'Combie being overlooked. His claims were then brought forward, and he should expect some explanation from the Directors, after the statement made by the noble Chairman and the feeling arising at the meeting in January last. Mr Barclay went on to refer to a resolution passed at Aberdeen for the election of Directors of the Society by signed lists, and stated that he understood that the Directors were to propose a new bye-law giving to the members power to suggest a list of members. He asked the meeting to consider, after the large number who voted for Mr M'Combie last year, thereby indicating the wishes of the Society that he should be appointed Director, what confidence had they that the Directors would in future pay any deference whatever to a representation by the members? He need not refer to Mr M'Combie's qualifications for the office. If it was a qualification to have exhibited largely and very successfully, he thought Mr M'Combie's claims on that score were nearly as great as those of any member of the Society. As for his age, an acquaintance with agriculture, and confidence of his fellow-farmers, on these grounds also he thought Mr M'Combie was entitled to a seat on the Board of the Highland Society; and in moving the amendment that Mr M'Combie be appointed a Director of the Society, he would only suggest to those members who were present, that unless outside parties did really take some interest in forcing on the affairs of the Society for the purposes for which the Society existed, he was afraid they could have little hope for improvement. They must have in the management and control of the Society gentlemen practically acquainted with agriculture, and who really knew what agriculture wanted, and how these difficulties must be met.

Mr HARRIS, Earnhill, seconded the motion. He said that the position occupied by Mr M'Combie rendered him perfectly independent of any slight, apparent or unintentional, on the part of even so august a body as the Highland and Agricultural Society. He laid great stress on the fact that the Chairman expressed his regret last year that Mr M'Combie could not then be appointed. He wished to know what the hon. member had done to disqualify him now? He had gained the confidence of one of the best and largest agricultural constituencies in Scotland; and, to show the estimation in which he was held by the farmers of Scotland, it might be stated that he was elected the second or third Chairman of the Chamber of Agriculture. In shows and otherwise he had done much to maintain the national breed of animals, and every animal he sent to the metropolitan market obtained an enhanced price. His large farms were perfect schools of agriculture. They were visited by his countrymen of all classes—from the farm-servant who wished to acquire a thorough knowledge of agriculture and breeding animals, up to men of fortune and even sovereignty itself—and yet he was not fit to sit at the Board of the Highland Society! He hoped the members would support the motion to elect Mr M'Combie, as there was not a more thorough representative of the tenantry of Scotland.

The CHAIRMAN said that reference had been made to what he had said last year in

regard to Mr M'Combie. At that time he was one of the *ex officio* members of the Board of Directors, but he was now a past Vice-President, and had not a seat at the Board. It was decidedly the feeling of the members of the Board when he was at it that Mr M'Combie should be appointed; and what were the reasons that had actuated the Directors on the present occasion he could not say. He had no doubt, that some member would explain why Mr M'Combie was not on the list of Directors. He hoped that the personal aspects of the question would not be introduced into it. There could be no doubt as to Mr M'Combie's qualifications; but the Directors might have more public grounds for the course they had taken than were supposed by the mover and seconder of the motion.

Captain TOD of Howden, said that, as Senior Director, he would explain the reasons why Mr M'Combie's name had not been put on the list. One was that he was a Member of Parliament, and that he would never be at the Meetings of the Board. All the Meetings of the Board were carried on between this and the month of June, and therefore a Member of Parliament was not well fitted to be a Director of the Highland and Agricultural Society. Another reason that weighed very much with him was that there had been a great deal of feeling regarding the Agricultural Society of Glasgow and the Show of this Society. It happened that the Show of the Society this year was to take place in Glasgow, and the Directors were anxious to get as much influence in that district as they could. It was therefore desirous that they should choose as many Members as they could from the west and the neighbourhood of Glasgow, so that they might have them at the Show this year. He was sure that every member would think that they were right in supporting the National Show of the Society. As to the remark that no tenant-farmers were on the list, he must say that the Directors did the best they could in that respect. Last year, before this meeting, they got a memorial from the stock-farmers or sheep-farmers in the high parts of the country. In that memorial it was said that they were not sufficiently represented at the Board; and the Directors had therefore appointed Mr Johnstone of Bodesbeck, a very extensive sheep-farmer. Although a proprietor, he was as strictly a farmer as there was in this country. There was also another, Mr Findlay, who was also a tenant-farmer; and therefore it could not be said that they had no tenant-farmers on the list. He thought that what the Directors should do would be to select Mr M'Combie next year as an extraordinary Director. Then he would have an opportunity of rendering his services at the Show of Aberdeen; and he hoped that this proposal would be carried out by the Board.

A MEMBER asked Mr Barclay whether he proposed to add Mr M'Combie's name to the list, or to put it in opposition to one already on the list.

THE CHAIRMAN said that the number of Directors was limited, and it would rest with Mr Barclay to say which of the names should be taken off.

Mr M'LAGAN of Pumpherston, M.P., said he quite saw the difficulty in which the Directors were placed at present. He would not yield to the proposer and seconder of Mr M'Combie in the respect he entertained for him as a practical farmer and man of business. But he had another feeling, that of loyalty towards the Directors of this Society, and until sufficient reason was shown that he should not exercise that loyalty he must vote for them. A very good reason was given by Captain Tod, to the effect that the Directors were selected from the districts in which the Show was to be held, and next year, as a matter of course, Mr M'Combie would be appointed. If he were not elected he was sure there would be such an expression of opinion from the members outside that he would certainly be put in. He thought that Mr Barclay and his seconder should withdraw the motion at present, seeing that there was every chance—the certainty, he should say—of Mr M'Combie being put on the list. He thought the motion as it stood was out of order. Mr Barclay very properly alluded to the want of practical men at the Board, and he hoped that the Directors would look to that matter. He remembered when he used to have a seat at the Board, that there were a considerable number of practical men at the Board, and he thought that that subject should be carefully attended to.

THE CHAIRMAN (to Mr Barclay)—Do you press your amendment?

MR BARCLAY—Do I understand that your Lordship rules that it is in order?

THE CHAIRMAN—It is in order, but you will have to add to the amendment the name of the Director you wish to delete.

MR BARCLAY said that if his Lordship insisted on mentioning a name he would do so, as he felt the necessity of pressing his motion. He did not know one of the gentlemen personally who had been proposed by the Board, and he would therefore move that Mr M'Combie's name be placed against the gentleman first on the list, the Hon. Greville R. Vernon.

Mr BETHUNE of Blebo said he hoped that Mr Barclay would not insist on his motion, as he was perfectly certain that Mr M'Combie would be appointed next year. He thought that the Society should be wakened up in many ways. He believed that they had one of the best secretaries in the world, and that the Directors, who did all

they could for the good of agriculture, tried to get hold of the best men—landlords and tenants—as Directors; but he thought it should be better understood whom they were to attack when they had complaints to make.

Captain TOD said that from what Mr M'Lagan had stated, it might be supposed that they had no tenant-farmers as Directors, but at the present time there were no fewer than ten on the list.

On a division, Mr Barclay's amendment was lost by a majority.

**PROPOSED NEW BYE-LAW.**—Mr AULDJO JAMIESON, C.A., moved the adoption of the following new bye-law, which was read at the General Meeting on 17th June last, and requires by the charter to be confirmed in and by this meeting:—"The Secretary shall, thirty days before the meeting of Directors, at which the list of Ordinary and Extraordinary Directors for the ensuing year is to be made up, intimate by advertisement in any two or more of the Edinburgh newspapers, that the Directors are prepared to receive from members of the Society, within eight days from the date of such intimation the names of such members as they may desire to suggest, for the consideration of the Directors, in making up the list to be recommended for the adoption of the Society at the General Meeting in January."

The bye-law was agreed to.

**ACCOUNTS FOR 1873-74.**—Sir WILLIAM GIBSON-CRAIG laid on the table the accounts for the year 1873-74, which were approved of.

**ARGYLL NAVAL FUND.**—Admiral Sir WILLIAM HOPE JOHNSTONE laid on the table the accounts of the Argyll Naval Fund for 1873-74, which showed a balance in the bank at 30th November 1874 of £333, 7s. 10d.

**INVERNESS SHOW, 1874.**—Mr GILLON of Wallhouse said—I have the honour to bring before you the report on the Inverness Show; but before moving the vote of thanks to the Local Committee and others connected therewith, I regret to state that the meeting resulted in a great loss to the Society. From the printed accounts which have just been submitted to you, you will observe the probable deficiency is set down at L.1400. This is the largest loss, I believe, the Society has ever sustained at any Show. The very exceptional character of the weather had no doubt much to do in preventing many of the general public from attending. In all other respects the Show was a great success. I have now to move the following votes of thanks:—"1. That the thanks of the Society are eminently due to the Hon. Simon Fraser, Master of Lovat, Convener of the Local Committee, for his kindness in undertaking that office, and for his ability in discharging the duties of chairman at the President's dinner at the Inverness Show, in the unavoidable absence of his Royal Highness the Prince of Wales. 2. That the thanks of the Society be given to the Commissioners of Supply for the counties of Inverness, Elgin, Ross, Cromarty, Caithness, Sutherland, and Nairn, for the liberality with which the usual auxiliary fund was provided for the Inverness Show; and also to the noblemen and gentlemen of these counties who formed part of the Committee of Superintendence. 3. That the thanks of the Society are due to Sir Kenneth Mackenzie of Gairloch, Bart., for acting as croupier at the President's dinner on the occasion of the Inverness Show. 4. That the thanks of the Society be given to the Town Council of Inverness, for their liberal donation towards the funds of the Inverness Show; and also to those gentlemen who formed part of the Committee of Superintendence. 5. That the thanks of the Society be given to the Black Isle Society, the Sutherland Farmers' Club, the North and West of Sutherland Farmers' Club, the Caithness Farmers' Society, the Wester Ross Farmers' Club, and the Nairnshire Farmer's Society, for their liberal contributions in aid of the funds of the Inverness Show."

The report was adopted.

**GLASGOW SHOW, 1875.**—Mr GILLON of Wallhouse said—I have to report that the General Show, which is this year to be held at Glasgow, will take place on the 27th, 28th, 29th, and 30th of July. The premiums offered amounted to L.2664, 16s., being L.1064 above what was offered in 1867, when the last Show was held at Glasgow. As on all former occasions, the Society is receiving the most cordial support from the Lord Provost, Magistrates, and Town Council. In addition to the free use of the Green for the purposes of the show-yard, the Directors have received from them the sum of L.200 towards the funds. Sir Michael Shaw Stewart has kindly consented to be named Convener of the Local Committee. In regard to the regulations, there are two new rules, to which I wish to call particular attention. The first is in reference to hefting, &c., and is as follows:—"Any artificial contrivance or device of any description found on an animal, either for preventing the flow of milk or for any other purpose, will disqualify that animal from being awarded a premium, and the owner of said animal will be prohibited from again entering stock for any of the Society's General Shows." The second is in regard to protests, and is in the following terms:—"Protests lodged for causes which the protestor produces no good evidence to substantiate, will render him liable to be reported to the Board of Directors, with the view, if they see fit, to his being prohibited from again entering stock for a General Show." The competition for thoroughbred stallions will be held on Tuesday the 23d February, at Glasgow, and

will be under the superintendence of the Glasgow Agricultural Society. The entries for this competition close with Mr Dykes, 79 St Vincent Street, Glasgow, on the 17th February.

Mr HARRIS, Earnhill, alluded to complaints made by some of the exhibitors at the Show at Inverness, and as to the strictness with which the rules were enforced by the Secretary. He urged particularly the necessity of looking better after the arrangements for supply of forage, which, he said, were very bad at Inverness.

The CHAIRMAN said that the rules could not be expected to be absolutely perfect, and the Secretary was only doing his duty when he saw that they were carried out. Mr Harris could send his suggestions to the Directors for consideration.

Mr BETHUNE of Blebo said he could endorse the remarks by Mr Harris as to forage; but said that the work Mr Menzies had to accomplish was almost superhuman.

The subject then dropped, and the report was adopted.

ABERDEEN SHOW, 1876.—Mr GILLON of Wallhouse said—I have to report that during last autumn requisitions were received from the counties of Aberdeen, Banff, and Kincardine, and the eastern division of Forfarshire, asking the Directors to hold the General Show for 1876 at Aberdeen. The requisitions were submitted to the Board, and it was remitted to the General Show Committee to name the classes of stock. The list was afterwards approved of by the Board, and laid before a meeting of members held at Aberdeen. At that meeting certain suggestions were made for the consideration of the Board. The Directors agreed to the same, and the list as finally adjusted I now lay on the table, and beg formally to move that the General Show for 1876 be held at Aberdeen; and that it be remitted to the Directors to carry out the necessary arrangements. Agreed to.

DISTRICT COMPETITIONS.—Mr CAMPBELL SWINTON of Kinmerghame gave in the following report in regard to District Competitions:—*Awards in 1874.*—The money premiums awarded in 1874 amount to £459, 15s., besides 13 silver, 335 medium silver, and 187 plough medals. *Premiums to be offered in 1875.*—Six districts for cattle at L.20, one silver and three medium silver medals each, L.134, 5s.; six districts for stallions at L.25 each, L.150; five districts for mares at L.8, and one medium silver medal each, L.42, 12s. 6d.; three districts for colts and fillies at L.19, and four medium silver medals each, L.68, 6s.; six districts for sheep at L.18, and one silver and four medium silver medals each, L.125, 8s.; one district for swine at L.8, one silver and two medium silver medals, L.9, 17s. *Special Grants.*—Edinburgh Christmas Club, L.50 and medium gold medal, L.56, 2s.; Ayrshire Association, L.20; Unst Society, L.20; Shetland Society, L.5; Island of Rousay, L.3; medium silver medals to 60 districts, L.100; ploughing competitions, L.50. In all, L.779, 10s. 6d.

The report was agreed to.

COTTAGE COMPETITIONS.—Mr CAMPBELL SWINTON, in the absence of Mr Maxwell Inglis of Loganbank, gave in the following report in regard to cottage competitions:—*Awards in 1874.*—The money premiums awarded amount to L.28, 10s., besides 36 medium and 41 minor silver medals, making a total expenditure of L.59, 14s. *Premiums to be offered in 1875.*—The premiums to be offered in 1875 are—six parishes at L.3 and four medals each, ten districts at two medals each, improving existing cottages and building new cottages, two gold medals—making the total amount offered L.50, 9s.

The report was adopted.

CHEMICAL DEPARTMENT AND AGRICULTURAL EDUCATION.—Mr SWINTON, Holyn Bank, in the absence of Sir Thomas Buchan Hepburn, Bart., read the following report of the Directors on this subject:—

“It will be in the recollection of members that at the General Meeting in June last it was agreed to discuss the report on the chemical department along with that on agricultural education, and that a discussion ensued, in the course of which various proposals were made, but they were either not seconded or were withdrawn in favour of a motion made by Mr Melvin, Bonnington, and seconded by Mr Walker of Bowland. That motion was in the following terms:—“That the meeting ask the Directors to appoint a committee of their own number and others to investigate the income and outlay of the Society, and to endeavour to provide sufficient funds for the purposes of the chemistry department and education. Delay consideration of these subjects in the meantime.” At the first meeting of Directors thereafter, held on 1st July, a committee consisting of Mr Walker of Bowland, *Convener*; Mr Murray of Dolerie; Mr Melvin, Bonnington; Professor Wilson; Professor Balfour; Mr Mylne, Niddrie Mains; Captain Tod of Howden; Sir Thomas Buchan Hepburn, Bart.; Mr Hope of Bordlands; Mr Goodlet, Bolshan; Mr Irvine of Drum; and Mr Gibson, Woolmet, was appointed to report in terms of Mr Melvin's motion. The committee held various meetings, and having carefully considered the matter remitted to them, agreed to a report at a meeting held on 11th November. In that report the committee made several suggestions under the different heads of expenditure as stated in the published accounts of the Society for the year 1872-73, and pointed out every possible source from which funds

for the purposes of the chemical department and education could apparently be provided. These sources were—

1. Funds available from Veterinary department, . . . . .	L.125	0	0
2. Estimated saving on the publication of the Transactions (say), . .	200	0	0
3. Probable saving on ordinary printing, advertising, &c., . . . .	50	0	0
4. Probable saving by reducing the number of Judges at the General Shows, . . . . .	50	0	0
5. Estimated saving on District Competitions, . . . . .	82	0	0
6. Probable saving on Essays and Reports, . . . . .	50	0	0

Making a total of . . . . . L.557 0 0

When the report came before the Directors on the 2d of December they agreed to increase the proposed saving on the Transactions by L.50, but resolved, that as no saving could in the meantime be effected under the contributions to district shows, that the above sum of L.82 should be struck off. This reduced the proposed saving to L.525; to which was added the sum expended last year on the chemical department, L.375; showing a sum of L.900 available for the chemical department and education. It will be observed that the largest saving is under the head Transactions; and as it concerns the interests of the members generally, it is necessary to call special attention to the manner in which it is proposed to be effected. The special committee having considered that the expenditure on the Transactions was unnecessarily large, when the value of the publication to the Society and to agriculture was taken into consideration, made various suggestions,—such as a diminution in the size of the publication, a moderate price to be charged for each copy, the cost of postage to be paid by applicants who do not call for their copies, &c. When the subject came to be discussed by the Board, they were of opinion that the volume now in course of being printed must be given gratis to members, but that those desirous of having the Transactions after this year should be charged the cost price; that the volume should be distributed without loss to the Society, except the cost of copies for presentation to agricultural societies and newspapers and other necessary expenses, which the Directors considered might be covered by L.180. In reporting upon the income of the Society, the committee found little room for remark or suggestion. The invested funds appeared to them to make as good a return as was compatible with safety. They pointed out that the subscriptions in aid of the chemical department had greatly diminished, and they suggested that those members of the Society who take special interest in the subject of agricultural chemistry should renew their exertions to obtain for the Society the same external aid as that which was formerly rendered. At the meeting of Directors on 2d December, when the committee's remarks on income were read, it was remitted to the Finance Committee to consider whether any part of the Society's funds could be invested at a higher rate of interest than that now received. At present the Society has no funds to reinvest, but the remit will be duly reported on when the committee meets to consider the reinvestment of sums falling due at Whitsunday next. After giving effect to the various suggestions of the special committee and Directors, an estimate of the income and proposed expenditure of the Society was framed, with the view of meeting the proposals made to the Society for the extension of the chemical department and the establishment of the educational scheme. In this estimate the sum of the chemical department was named at L.700, and that for the educational scheme at L.250, and it exhibited a small surplus of about L.20. A special meeting of the Board was held on the 9th of December, when, after considerable discussion, it was moved by Sir Thomas Buchan Hepburn, and seconded by Mr Harvey, Whittingham Mains, that a chemist to the Society be appointed. As an amendment, it was moved by Mr Milne Home, that before it is decided to appoint a chemist, his duties should be defined. On a show of hands being taken, 7 Directors voted for Sir Thomas Hepburn's motion, Mr Milne Home's amendment not being seconded, could not be put to the meeting. Sir Thomas's motion was accordingly carried. It was thereafter resolved—(1.) That it be remitted to the Chemistry Committee to define the duties of the chemist, bearing in mind the sum at the disposal of the Directors, viz., L.700; (2.) That a practical agriculturist be appointed to superintend the field experiments; (3.) That the Chemistry Committee draw up a Memorial to the Board of Trade, urging them to establish agricultural experimental stations throughout Scotland; (4.) That the general meeting be recommended to carry out the suggestions contained in the report by the Council on Education, as far as the funds will allow. In terms of this remit the Chemistry Committee met on the 23d December, when the Chairman submitted a draft report, detailing the duties of the chemist and the assistant-agriculturist. This report was agreed to by a majority. In the report the objects of the chemical department are stated to be:—1. To prosecute researches in various subjects connected with agricultural chemistry. 2. To conduct accurate field experiments under the personal superintendence and inspection of the chemist and a com-



petent agriculturist. 3. To perform analysis of manures, soils, vegetable products, &c., for members of the Society. The report also recommended that the L.700 should be apportioned as follows:—chemist's salary, L.300; expenses in conducting experiments, L.100; agricultural attendant's salary, L.150; travelling expenses of do., L.50; experimental stations, L.100: total, L.700. In the programme of the chemist's duties a sum, it will be observed, is provided for experiments to be conducted by the agricultural assistant, under the direction of the chemist. It is proposed that all products grown on the land of these experimental stations should be carefully weighed when they are grown, and a suitable quantity of each brought to Edinburgh, and that all the necessary chemical work should be carried on by the chemist in his laboratory. This will in some measure answer the ends of an experimental station, as the products of the land in different districts will be brought into the same laboratory to be analysed, and the peculiarities of climate, altitude, and soil be duly considered in each case, and there is every reason to expect that, under the management of an able chemist, satisfactory results may be hoped for. In the course of the discussion which took place on the reading of the report it was stated (1), That the chemist should be at liberty to make analyses for parties not members of the Society. (2), That the assistant-agriculturist should be responsible to the chemist, and devote his whole time to the duties of the office. The report was printed in full, and circulated among the Directors and members of the Chemistry Committee. In regard to the second part of the remit, the committee prepared a Memorial to the Board of Trade on the subject of agricultural experimental stations. (This Memorial is given below.) At the meeting of the Directors on the 6th of January, the minutes of the Board of the 2d and 9th December, and of the Chemistry Committee of the 23d, were read, as well as letters on the subject from Mr Melvin, when the various minutes were approved, Mr Milne Home dissenting. The report by the Council on Education, of the 2d June last, was then taken up by the Board, when it and the proposed new bye-laws were approved, except that the number and amount of bursaries were fixed at ten at L.20, and five at L.10; in all, L.250. It is proper to add, that the Directors, at their meeting on 1st July, adopted a Memorial to the Lords of the Committee of Council on Education on the propriety of establishing agriculture as a branch of the system of physical science taught under the superintendence of the Department of Science and Art in the public schools; and that an answer was received, stating that while their Lordships are disposed to accede to the request, it was too late to include for this year the science of agriculture in the list of subjects towards instruction, in which aid is granted by that department. The case was therefore reserved for future, but early consideration. If the meeting is pleased to approve of the proceedings now reported on, it must be borne in mind that the Transactions will after this year cease to be issued free, and that members desirous of having the volume in future will be charged cost price."

After reading the report, Mr Swinton moved its adoption.

The following Memorial to Government in reference to the establishment of agricultural experimental stations was then read:—

"Unto the Right Hon. Sir Charles B. Adderley, President of the Board of Trade:  
The Memorial of the Highland and Agricultural Society of Scotland, incorporated by Royal Charters, sheweth, —

"That the Society consists of upwards of four thousand of the principal proprietors, tenant-farmers, and scientific men of Scotland. That one of the objects for which the Society was founded is the advancement of the science of agriculture, with which view the Society has, by means of prizes and money grants, endeavoured to encourage observations, experiments, and discoveries in other sciences connected with agriculture, such as chemistry, botany, geology, meteorology, and arboriculture. That the Society has lately been inquiring into the system pursued at Rothamstead and in Germany for advancing the science of agriculture by means of experimental stations, where trials are made of new kinds of grasses, grain, and green crops, and also of the effect of new artificial manures on soils of different qualities. That these stations abroad consist of a few acres of ground and suitable offices attached, managed by a scientific superintendent and others to assist him. That your memorialists much desire to see stations of the same kind formed in Scotland, being satisfied that observations and conclusions can be satisfactory only when the result of scientific care and precision. That the Society strongly urge on the Government the expediency of establishing stations in different districts of Scotland, or of advancing scientific research in any other manner which may appear to be more conducive to the progress of agriculture. That in the arrangement of any scheme the Board of Trade may recommend to Her Majesty's Government, the Society will be glad to aid by giving all the information they have collected on the subject. The Society would humbly suggest that Her Majesty's ambassadors and consuls be instructed to report to Government upon any agricultural experimental station carried on in the countries with which they are officially connected."

Mr BARCLAY, M.P., said that he took no objection to the part of the report referring to the Memorial to the Government on the subject of experimental stations, or to the proposed agricultural scholarships to the amount of L.250—he should have been glad if the Directors had seen their way to make it L.300; but as to the recommendations with reference to the chemical department, it did not seem to him that there was any material difference from the state of things which formerly existed. Several years ago elaborate analyses were made under the superintendence of Dr Anderson, of the soils and productions, and after a few years the experiments were found not to be successful, or to yield the results which were expected. The proposal of this committee was simply to revert to that practice, with the addition of a practical agriculturist, who, he supposed, was going from farm to farm in a peripatetic sort of way to look after the experiments. It would require a great many years of experiments conducted in that way to come to any definite conclusion on the various agricultural phenomena which it was desirable to investigate. There were two principles which ought to guide the Society in dealing with this subject as with others, and one of these was that the Society existed for the purpose of aiding farmers in doing what they could not do for themselves, or only at a much greater cost. They were going to do away with the bonus of the Transactions, for which they were to charge a price in future, and they were to give analyses by the chemist who was to be appointed at a reduced price. It seemed to him that it would be better to continue the volume, because the analysis of a manure only benefited the member who applied for it, and he could get it easily and satisfactorily done at a fair market price. It might benefit some of his neighbours, but at present a score of farmers in any district by subscribing 5s. each, would get an analysis by any chemist, and the trouble and time of the chemist of the Society would be saved in making an analysis for the exclusive benefit of each individual farmer who sent to him for it. There were three or four such societies in Aberdeen, and he did not think that the Highland Society could supply analyses more cheaply or advantageously. Another principle of great importance to be kept in view in considering this question was that the officials of the Society should devote their whole time to the service of the Society. Mr Bethune complained strongly of the great amount of work the Secretary had to do in attending to the multifarious duties of the Society. He had no doubt the Secretary looked fairly after the interests of the Society, but besides that work, and although he was paid a high salary—a much higher salary than the secretary of the Royal Society—he had to look after the interests of

large families entirely in his own hands. That put a man in a delicate position. He received a certain sum of money for which he might very nearly do as much or as little as he pleased. That was, he thought, exceedingly unsatisfactory. If any chemist was to be retained by the Society, he ought to devote all his time within reasonable limits to the service of the Society; and it seemed to him that what the Society ought to have was a qualified gentleman to devote his whole time to the investigation of agricultural phenomena, and to give information as to how the scientific principles of agriculture which he might discover, or were already discovered, could be applied in practice. He thought that any arrangement to be come to at present in regard to the experiments should only be for a time, in order to see how the arrangement might work. If there was not sufficient work at one station for the chemist, he understood that some noblemen and gentlemen had offered land for stations gratis; and he had no doubt that if the Directors went heartily into the subject they would find a great amount of co-operation in the various districts of the Society. He mentioned that a meeting of members in Aberdeen had considered that the Society should rather move in the direction of experimental stations than in the reappointment of a chemist; and he moved as an amendment to that part of the report, that with regard to the chemical arrangements proposed the meeting would prefer the establishment for a limited period of an experimental station or stations, and that the L.700 referred to in the report be reserved in the meantime, and held available for the maintenance of one or more such stations, to be managed by officials whose whole time and services shall be given to the Society.

Mr MILNE HOME of Wedderburn, in seconding the amendment, expressed his concurrence with the last two parts of the report. In the course of his remarks he referred to the success of the experimental stations in Germany, and that of Rothamstead in England, where the most extraordinary discoveries had been made, which would have a most important bearing on agriculture, and were likely to revolutionise the system of the cultivation of farms, if it turned out that they were suitable for the climate of Scotland. Mr Lawes had been rearing white crops from the same field for twenty or thirty years; and if it were to be established by means of such stations that the farmers of Scotland could have more freedom of cultivation than under the present restrictions with regard to rotation, he only regretted that they had not had experimental stations before now. He regretted that he could not go with the Directors in regard to the appointment of a chemist. The report, however, did not come with great weight and authority before the meeting. The scheme was not drawn by the Directors, but by the

Chemical Committee. All the Directors did was to resolve to have a chemist. He thought they should have seen what the duties were to be before making the appointment. They were acting like a man who first bought a horse and then consulted his friends as to how to use it. The committee consisted of eighteen persons. Only eight assembled, of whom four gentlemen supported the report; the other four declined to do so—one of the latter being a gentleman who knew more about the matter than anybody else on the committee. He referred to the Professor of Agriculture, and late Principal of Cirencester College. Two voted against, and two remained neutral. After speaking to the fact that the services of the chemist were not to be given altogether to the Society, Mr Milne Home proceeded to remark that the chief objection he had to the scheme was that adverted to by Mr Barclay, that it had failed as an experiment formerly. As to the Society giving analyses of manures at a cheap rate through their chemist, he held that it was better to encourage the system which at present prevailed throughout the country in regard to that matter, and concluded by stating that he thought that was an illegal purpose to which to apply their funds.

The Marquis of LOTHIAN, in reply to Mr Milne Home's last objection, referred to the constitution of the Society, which set forth that one of the advantages to members was that they could consult the chemist at reduced rates. He then stated that he understood the amendment did not apply to the part of the report with reference to the Memorial to the Board of Trade urging them to establish experimental stations in Scotland, or to the recommendation of the Council on Education, and that these were approved of.

Mr BARCLAY stated that the amendment referred only to the portion of the report relating to the chemistry department.

Mr MELVIN, Bonnington, called attention to the fact that members had not previously had an opportunity of hearing or seeing the report, and stated that it would be a pity for the Society to proceed rashly, and make arrangements which in a year or two might be found to be faulty and would require to be altered. He therefore thought it would be desirable to delay this matter. In the course of some further remarks, he showed the importance of having one of those appointed made a head of the department; otherwise, he said, they could not expect to do much in the way of fresh investigations.

Mr DUNDAS of Arniston suggested that the matter might be remitted back to the Directors for further consideration, and that they bring up a report in June.

Mr MELVIN said that this proposal was very good, but the Directors might be asked to take advantage of the delay in obtaining further information.

Mr GREIG, Harvieston, hoped the report of the committee should be brought before the members in good time, so that they might be able to make up their minds on the subject before coming to the meeting. He also spoke at some length on the importance of education in chemistry as applied to agriculture, and its success in Germany.

Mr BINNING HOME of Argaty urged the importance of stimulating agriculturists to acquire a knowledge of chemistry to such an extent as that they could apply manures in the most profitable way to their crops.

Mr CHARLES DUNCAN, Woodend, Rothesay, stated that he approved of the Directors' scheme as one that should be gone into heartily by all the members of the Society. They should show that they were as well able to manage these things in Scotland as in Germany.

Professor WILSON suggested that as the chemical portion was to be delayed, the sum set aside for bursaries might be £300.

Mr DUNDAS said he did not know that that motion would be in order, as that part of the report had been agreed to.

Mr BARCLAY stated that after the argument for delay he did not wish to press his motion. But the subject had been before them for eighteen months, and he should have thought that the members of the Society would have had some idea on the matter before this time.

The Duke of BUCCLEUCH said his feeling was strongly in favour of Mr Dundas' motion.

Mr Barclay's motion having been withdrawn, that of Mr Dundas was unanimously adopted, and the portion of the report relating to the Chemistry Department remitted back to the Directors.

The proposed new bye-laws in reference to agricultural education were then read and approved, and, in terms of the Charter, will be brought up for confirmation at the next general meeting in June. The Bye-Laws will be found in Appendix B.

EXAMINATIONS IN THE TECHNOLOGY OF AGRICULTURE.—The Secretary read the letter from the Society of Arts, London, on this subject, and with reference to this Society founding scholarships (see page 9).

CHEMICAL DEPARTMENT.—Professor DEWAR gave in his report in regard to the Chemical Department:—"During the last six months the number of analyses of guanios,

manures, feeding stuffs, and other substances made for members of the Society, have exceeded that of any previous session. No grave cases of adulteration have come under my notice. The estimate, however, of the value appended to the analyses for guidance, has in many cases differed from the market price, and several samples of oil cake containing large proportions of nutritive substances were rendered dangerous and inferior from the presence of a large proportion of sand. A number of samples of potable waters used by members of the Society have been examined, and several found contaminated with sewage matter, generating on exposure to light numerous infusoria. Confirmation of the unhealthy state of people using such waters has been derived from the medical attendant, and the attention of all members of the Society ought to be directed to the danger of using waters in any way liable to get surface or sewage drainage, as often occurs in wells sunk near farms. The great variation of late in the quality of the imported guano made it the duty of the chemist to procure authentic samples of the different substances sold by the agents of the Peruvian Government in this country. I have to acknowledge the kindness of Messrs Berry, Barclay, & Co., of Leith, in allowing me to take samples from a recent cargo of raw guano, and also from their stock of dissolved Peruvian Government guano, for the purpose of acquainting the Society with the quality of the vended products; and I am in a position to state that the raw guano lately delivered is of good quality, although moist and adhesive, and the dissolved guano continues to contain the amount of ammonia and phosphates guaranteed by Ohlendorf & Co., who hold the special concession of the manufacture from the Peruvian Government. It may be of importance to the Society to know that the great dissatisfaction that has existed for some time regarding the estimates of phosphates and potash salts by different analysts, has resulted in the appointment of a committee of chemists by the British Association, for the object of reporting on the methods generally employed in the analyses of these substances, and to advise as to some uniform system. As the chemical representative of the Highland and Agricultural Society, I have been requested to act as a member of this committee, and beneficial results may be anticipated from its deliberations."

Mr BARCLAY said he thought the chemist was going out of his way in valuing manures, and that it was sufficient if he gave the analyses.

Professor DEWAR said that when he got samples of manure to analyse he was always asked his opinion as to the value.

Mr DUNCAN, Woodend, thought the analysis would be of little use without a statement of the value.

Mr BARCLAY moved—"That the chemist of the Society do not value manures in future."

Mr HUNTER of Thurston said if he wanted the chemist to give him the value of manure of which he had sent samples, he did not think the Society could prevent him doing so.

Mr WALKER of Bowland said he thought this was a very small portion of the subject which the Society had resolved to delay.

Mr Barclay's amendment was not seconded, and the subject then dropped.

VETERINARY DEPARTMENT.—Captain TOD of Howden gave in the report on this department, giving the details of the proceedings at the examinations in July last, and also referring to the late Dr Dumbreck, who had been one of the veterinary examiners for many years.

The report was adopted.

AGRICULTURAL REPORTS.—Mr WALKER of Bowland reported the premiums awarded for reports on the science and practice of agriculture and those offered for competition in 1875, which were approved of.

FORESTRY DEPARTMENT.—The SECRETARY, in the absence of Professor BALFOUR, reported the awards for reports in the Department of Woods and Forests, as well as those offered for competition in 1875.

The report was adopted.

TRANSACTIONS.—Mr IRVINE of Drum gave in the report as to the contents of volume VII.

ORDNANCE SURVEY.—Mr DUNDAS of Arniston reported that the following committee has been appointed to watch over the progress of the survey in Scotland:—Mr Dundas of Arniston, Mr Mackenzie of Portmore, Mr Walker of Bowland—Mr Dundas, convener.

STEAM CULTIVATION.—Mr HUNTER of Thurston gave in the following report:—"I have to report that the exhibition of steam cultivators which was proposed to be held early last autumn in the neighbourhood of Edinburgh was extensively advertised, and that schedules of entry and copies of the regulations were sent to all the makers of steam cultivators known to the Society. The committee held a meeting early in September, when, I regret to say, they had no alternative but to intimate that the proposed exhibition would not take place, in consequence of there being no entries. On application to Mr Mylne, Niddrie Mains; Mr Monteith, Liberton Tower Mains;

and Mr Hope, Duddingston, these gentlemen kindly consented to give land, and I have to propose that the thanks of the Society be voted to them."

Agreed to.

The Hon. GEORGE WALDEGRAVE LESLIE moved, seconded by Mr McLAGAN, M.P. -- "That it be remitted to the Directors for consideration, whether it will not be desirable forthwith to appoint a Standing Steam Committee, who shall receive reports from those members of the Society who employ steam cultivation, the said Committee also to recommend rewards or medals as encouragements for decided improvements in the method or cheapness of using steam-power for cultivation."

Mr GREIG said he thought that one of the greatest difficulties in regard to steam-cultivation was the management of the machines, and that it would be well if some means could be adopted of encouraging the men who had the charge of them.

Mr BARCLAY said that the great difficulty felt in the north of Scotland was as to the working of the machinery.

The motion was then adopted.

SELECTION OF JUDGES OF STOCK AT GENERAL SHOWS.—The Secretary stated that he had yesterday received notice of the following motion by Mr Barclay, M.P., but that, as it was not lodged within the period prescribed by the Bye-Laws, it could not be submitted for immediate decision to this meeting:—"That the Directors be recommended, for the purpose of ascertaining who are considered best qualified to act as judges at the Society's Show, to forward to each exhibitor a list of the exhibitors in the group of classes to be judged by one set of judges, and in which he is an exhibitor, and invite him to submit, for the information of the Directors, the names of the three gentlemen (not themselves exhibitors in the group) whom he considers best qualified to act as judges for that group."

At the request of Mr BARCLAY, the motion was remitted to the Directors for consideration with the view of being laid before the next General Meeting.

On the motion of the Hon. GEORGE WALDEGRAVE LESLIE, a vote of thanks was given to the Chairman, and the proceedings terminated.

## PREMIUMS AWARDED BY THE SOCIETY IN 1874-75.

## I.—REPORTS, 1875.

## AGRICULTURAL.

1. James Macdonald, Special Reporter for the "Scotsman," Aberdeen, for a Report on the Agriculture of the County of Caithness,	L.30	0	0
2. David Robie, Landsdowne Terrace, Bedford, for a Report on the Formation and Management of Water Meadows in England,	20	0	0
3. George Bruce, Wealthiton, Keig, Aberdeen, for a Report on the Best Mode of Cultivating Grass in Scotland under a Rotation,	10	0	0
4. Rear-Admiral Campbell of Barbreck, Lochgilphead, for a Report on the Improvement of Waste Land on the Estate of Barbreck, Argyllshire, The Gold Medal,	10	0	0
5. Walter Kidd, Ballaney, Currie, for a Report on the Reclamation of Waste Land on the Farms of Ramsacks and Ballaney, Midlothian, The Gold Medal,	10	0	0
6. John McCulloch, Stranraer, for a Report on the Changes taking place in Milk to the production of Butter and Cheese, and of the Dairy System generally as pursued in Galloway, The Medium Gold Medal,	6	2	0
7. Thomas Ogilvy of Corrimony, Inverness, for a Report on a New System of Wire Fencing, The Medium Gold Medal,	6	2	0
8. Hugh Borthwick, Old Caberston, Innerleithen, for a Report on the Use of Artificial or Foreign Feeding Substances,	3	0	0
9. Mary Shaw, Bogfern, Tarland, for a Report on Improvements on the Estate of Hallhead, Aberdeenshire, Minor Gold Medal,	3	15	0

## FORESTRY.

10. Lewis Bayne, Forester, Kinnel Park, Abergele, North Wales, for a Report on Planting Exposed Land, Plate, value,	5	0	0
11. Robert Hutchison of Carlowrie, Kirkliston, for a Report on the <i>Cedrus</i> <i>Deodara</i> , Plate, value,	5	0	0
12. Andrew Gilchrist, Forester, Urie, Stonehaven, for a Report on Natural Coppice Wood of other Species than Oak, Plate, value,	5	0	0
13. John Nisbet, Probationer for H.M. Indian Forest Service, Hanover, for a Report on the Soils and Subsoils suited for the Various Species of Forest Trees, The Medium Gold Medal,	6	2	0
14. William Gilchrist, Forester, Cluny Castle, Aberdeen, for a Report on the same Subject, Plate, value,	5	0	0
	L.125	1	0

## II.—STIRLING SHOW, 1873.

Award at trial at Carsebonny Farm, 14th May 1874—Thomas Pirie & Co., Kinnmundy, Longside, Aberdeenshire, for Patent heavy land Cultivator, Silver Medal.	0	16	0
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## III.—INVERNESS SHOW, 1874.

## CLASS I.—CATTLE.

## SHORTHORN.

## SECTION 1. BULLS calved before 1st January 1873.

1. Robert Bruce, Newton of Struthers, Forres, "Lord Irwin" (29,123),	L.25	0	0
2. A. H. Browne, Doxford, Chathill, Northumberland, "Duke of Aosta" (28,356),	15	0	0
3. W. S. Marr, Upper Mill, Tarves, "Earl of Derby 2d" (31,061),	10	0	0
4. Walter Scott, Glendronach, Huntly, "Jeweller," Reserve Number, Breeder of Best Bull—William Linton, Sheriff Hutton, York, Silver Medal,	0	16	0

## SECTION 2. BULLS calved after 1st January 1872.

1. William Linton, Sheriff Hutton, York, "Sir Arthur Ingram" (32,490),	25	0	0
2. James Fletcher of Rosehaugh, Avoch, "Ballimore" (30,411),	15	0	0
3. Evan Baillie of Dochfour, Inverness, "Golden Glove,"	10	0	0
4. William A. Fraser, Brackla, Nairn, "Star of the Forth," Reserve Number,			

## SECTION 3. BULLS calved after 1st January 1873.

1. A. H. Browne, Doxford, Chathill, Northumberland, "Rosario,"	15	0	0
2. James Bruce, Burnside, Fochabers, "Duke of Richmond,"	10	0	0
3. Evan Baillie of Dochfour, Inverness, "Flower of the Forest,"	5	0	0
4. Robert Scott, Manbeem, Elgin, "Lord St Leonards 2d," Reserve Number,			

Carry forward, L.130 16 0

Brought forward, L.130 16 0

## SECTION 4. COWS of any age.

1. Robert Bruce, Newton of Struthers, Forres, "Fair Tyne,"	20	0	0
2. William A. Mitchell, Auchnagathle, Whitehouse, Aberdeen, "Hawthorn,"	10	0	0
3. John Cran, Kirkton, Inverness, "Princess Lovely,"	5	0	0
4. Jas. Lawrence, Thornhill, Forres, "Lady Elma 3d,"	Reserve Number,		

## SECTION 5. HEIFERS calved after 1st January 1872.

1. Her Majesty the Queen, the Prince Consort's Shaw Farm, Windsor, "Carolina 4th,"	15	0	0
2. William S. Marr, Upper Mill, Tarves, Aberdeen, "Maud 5th,"	10	0	
3. John Cran, Kirkton, Inverness, "Nectar,"	5	0	0
4. Andrew Longmore, Rettie, Banff, "Madame Grisl,"	Reserve Number,		

## SECTION 6. HEIFERS calved after 1st January 1873.

1. William S. Marr, Upper Mill, Tarves, "Missie 40th,"	10	0	
2. The Duke of Richmond, K.G., Gordon Castle, Fochabers, "Interlude,"	8	0	
3. Jas. Bruce, Burnside, Fochabers, "Princess 2d,"	4	0	
4. J. J. Sharp, Broughton, Kettering, Northampton, "Julia 11th,"	Reserve Number,		

## POLLED ANGUS OR ABERDEEN.

First Prize Bulls at former Shows—Exhibited for Medium Gold Medal.

•Kelso, 1872, when the property of Sir Thomas Gladstone of Fasque, Bart., Laurencekirk—Sir George Macpherson Grant of Ballindalloch, Bart., Ballindalloch, "Adrian" (439),	Plate, value			5	0	
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## SECTION 7. BULLS calved before 1st January 1872.

1. Alexander Bowie, Mains of Kelly, Arbroath, "Gainsborough" (596),	20	0	
2. The Earl of Fife, K.T., Duff House, Banff, "John Bright,"	10	0	0
3. Sir George Macpherson Grant of Ballindalloch, Bart., "Scotsman" (474),	5	0	
4. William Robertson, Burnside, Ballindalloch, "Jester" (472),	Reserve Number,		
Breeder of Best Bull—Alexander Bowie, Mains of Kelly, Arbroath, Silver Medal,	0	16	0

## SECTION 8. BULLS calved after 1st January 1872.

1. James Scott, Easter Tulloch, Stonehaven, "Blue Beard,"	20	0	0
2. George Reid, Baads, Peterculter, Aberdeen, "Prince Albert,"	10	0	0
3. George Gordon, Tullochallum, Dufftown, "Knight of Avon,"	5	0	0
4. John Morrison, Auchlin, Turriff, "Elector,"	Reserve Number,		

## SECTION 9. BULLS calved after 1st January 1873.

1. The Earl of Fife, K.T., Duff House, Banff, "Young Viscount,"	10	0	0
2. George Reid, Baads, Peterculter, Aberdeen, "Prince Charlie,"	5	0	0
3. William McCombie of Easter Skene, Skene, Aberdeenshire, "Bachelor,"	5	0	0
4. Wm. Jas. Tayler, Rothiemay House, Huntly, "Canmore," (626),	Reserve Number,		

First Prize Cows at former Shows—Exhibited for Medium Gold Medal.

Stirling, 1873, when the property of the present Exhibitor—Sir George Macpherson Grant of Ballindalloch, Bart., Ballindalloch, "Beitha" (980),	Plate, value			5	0	0
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## SECTION 10. COWS of any Age.

1. Wm. Jas. Tayler, Rothiemay House, Huntly, "Kate 2d" (1482),	20	0	0
2. The Earl of Fife, K.T., Duff House, Banff, "Corriemulzie,"	10	0	0
3. Sir George Macpherson Grant of Ballindalloch, Bart., "Eva" (984),	5	0	0
4. The Marquis of Huntly, Aboyne Castle, Aboyne, "Dora" (1282),	Reserve Number,		

## SECTION 11. HEIFERS calved after 1st January 1872.

1. The Earl of Fife, K.T., Duff House, Banff, "Innes,"	10	0	0
2. The Earl of Fife, K.T., Duff House, Banff, "Kate 3d,"	6	0	0
3. William M. Skinner, Drumlin, Ballindalloch, "Sweetheart" (1689),	4	0	0
4. George Reid, Baads, Peterculter, Aberdeen, "Heather Bell,"	Reserve Number,		

## SECTION 12. HEIFERS calved after 1st January 1873.

1. George Reid, Baads, Peterculter, Aberdeen, "Sibyl,"	8	0	0
2. George Reid, Baads, Peterculter, Aberdeen, "Halt,"	5	0	0
3. The Earl of Fife, K.T., Duff House, Banff, "Edith,"	3	0	0
4. The Marquis of Huntly, Aboyne Castle, Aboyne, "Myrtle" (1588),	Reserve Number,		

Carry forward, L.987 12 0

Brought forward, L.387 12 0

## GALLOWAY.

First Prize Bulls at former Shows—Exhibited for Medium Gold Medal.

Stirling, 1873, when the property of the present Exhibitor—James Cunningham, Tarbreoch, Dalbeattie, "Pretender" (617), . . . . . 5 0 0

## SECTION 13. BULLS calved before 1st January 1873.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig Castle, Thornhill, "Black Prince of Drumlanrig" (546); . . . . . 20 0 0
2. Robert Jardine of Castlemilk, Lockerbie, "Cunningham," . . . . . 10 0 0
3. George Graham, Oakbank, Longtown, "Forest King" (553), Reserve Number, Breeder of Best Bull—James Cunningham, Tarbreoch, Dalbeattie, Silver Medal, . . . . . 0 16 0

First Prize Cows at former Shows—Exhibited for Medium Gold Medal.

Stirling, 1873, when the property of the present Exhibitor—The Duke of Buccleuch and Queensberry, K.G., Drumlanrig Castle, Thornhill, "Louisa 2d" (1379), . . . . . 6 2 0

## SECTION 14. COWS of any age.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Juno of Drumlanrig" (1641), . . . . . 15 0 0
2. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Louisa of Drumlanrig" (1642), . . . . . 8 0 0
3. James Graham, Parcelstown, Longtown, "Dame Margaret Douglas" (1327), Reserve Number, . . . . .

## SECTION 15. HEIFERS calved after 1st January 1872.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Nerio" (1657), . . . . . 10 0 0
2. James Cunningham, Tarbreoch, Dalbeattie, "Mary 2d" (1671), . . . . . 5 0 0
3. James Cunningham, Tarbreoch, Dalbeattie, "Bridesmaid" (1674), Reserve Number, . . . . .

## SECTION 16. HEIFERS calved after 1st January 1873.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Abeona" (1883), . . . . . 8 0 0
2. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Amy" (1902), . . . . . 4 0 0
3. James Cunningham, Tarbreoch, Dalbeattie, "Flora 2d" (1673), Reserve Number, . . . . .

## AYRSHIRE.

## SECTION 17. BULLS calved before 1st January 1873.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Statesman," . . . . . 20 0 0
2. Robert Wardrope, Garlaff, Cumnock, "Champion," . . . . . 10 0 0
3. David Edmond of Ballochruin, Balfour, "Herd Laddie," . . . . . 5 0 0
4. Sir Michael R. Shaw Stewart of Ardgowan, Bart., Greenock, "Lofty," Reserve Number, . . . . .

Breeder of Best Bull—John Mitchell, Cairn, Mearns, Renfrewshire, Silver Medal, . . . . . 0 16 0

First Prize Cows at former Shows—Exhibited for Medium Gold Medal.

Stirling, 1873, when in milk, and the property of the present Exhibitor—Robert Wilson, Forehouse, Kilbarchan, "Hornie," . . . . . 5 0 0

## SECTION 18. COWS in Milk of any age.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Dewdrop," . . . . . 15 0 0
2. Robert Wilson, Forehouse, Kilbarchan, "Osborne," . . . . . 8 0 0
3. The Duke of Buccleuch and Queensberry, K.G., "Snowdrop," . . . . . 4 0 0
4. The Duchess Dowager of Athole, Dunkeld, "May," . . . . . Reserve Number,

## SECTION 19. COWS in Calf of any age, or Heifers in Calf, calved before 1st January 1872.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Modesty," . . . . . 15 0 0
2. John Graham, 7 Oldsmithhills Street, Paisley, "Ayrshire Lassie," . . . . . 8 0 0
3. Duncan Ross, Hilton, Inverness, "Jane," . . . . . 4 0 0
4. John Stewart, Burnside Cottage, Strathaven, "Beauty," . . . . . Reserve Number,

## SECTION 20. HEIFERS calved after 1st January 1872.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "British Queen," . . . . . 10 0 0
2. William Ure, Bogton, Falkirk, "Dora," . . . . . 5 0 0
3. John Stewart, Burnside Cottage, Strathaven, "Brown Lady," . . . . . 3 0 0
4. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Border Queen," Reserve Number, . . . . .

Carry forward, L.592 6 0



Brought forward, L 592 6 0

## SECTION 21. HEIFERS calved after 1st January 1873.

1. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Princess,"	8 0 0
2. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Charmers,"	4 0 0
3. The Duke of Buccleuch and Queensberry, K.G., Drumlanrig, "Myrtle,"	2 0 0
4. John Stewart, Burnside Cottage, Strathaven, "Danty,"	Reserve Number,

## HIGHLAND.

First Prize Bulls at former Shows—Exhibited for Medium Gold Medal.

Kelso, 1872, when the property of the present Exhibitor—The Hon. Lady Menzies, Rannoch Lodge, Pitlochry, "Rannoch,"	6 2 0
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## SECTION 22. BULLS calved before 1st January 1871.

1. The Duke of Athole, K.T., Blair Castle, "Sgiathaneach,"	20 0 0
2. Alex. S. Stephenson, Auchinnellan, Ford, Lochawe, "Bruce,"	10 0 0
3. Cluny Macpherson of Cluny Macpherson, "Hector,"	5 0 0
4. The Duke of Sutherland, K.G., Dunrobin Castle, "Golspie,"	Reserve Number,
Breeder of Best Bull—John Stewart, Duntulm, Portree,	Silver Medal, 0 16 0

## SECTION 23. BULLS calved after 1st January 1871.

1. John Grant, Inverlaidnan, Carr-Bridge, "Wallace,"	20 0 0
2. The Earl of Seafield, Castle Grant, Grantown, "Crinan,"	10 0 0
3. William Fraser, Lairg, Daviot, Inverness, "Charlie,"	5 0 0
4. The Duke of Sutherland, K.G., Dunrobin Castle, Golspie,	Reserve Number,

## SECTION 24. BULLS calved after 1st January 1872.

1. John Stewart, Bochartie, Callander,	10 0 0
2. Lord Middleton, Applecross, Lochcarron, "Royal George,"	5 0 0
3. John Stewart, Duntulm, Portree, "Rob Roy,"	3 0 0
4. John Stewart, Duntulm, Portree, "Gillie Callum,"	Reserve Number,

## SECTION 25. BULLS calved after 1st January 1873.

1. Archibald Stewart of Ensay, Stornoway, "Rob Og,"	5 0 0
2. The Earl of Seafield, Castle Grant, Grantown, "Ronald,"	3 0 0
3. The Earl of Seafield, Castle Grant, "Allister Dubh,"	1 0 0
4. Lieut-Colonel C. Greenhill Gardyne, Glenforsa House, Mull, Aros, "Fear-a-Bhaile,"	Reserve Number,

First Prize Cows at former Shows—Exhibited for Medium Gold Medal.

Kelso, 1872, when the property of the present Exhibitor—John Stewart, Duntulm, Portree, "Guanach Og,"	Plate, value 5 0 0
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## SECTION 26. COWS of any age.

1. The Duke of Athole, K.T., Blair Castle, Blair-Athole, "Buidheag,"	15 0 0
2. The Duke of Athole, K.T., Blair Castle, Blair-Athole, "Ann Og,"	8 0 0
3. John Stewart, Duntulm, Portree, "Guanach Riabhach,"	4 0 0
4. The Earl of Seafield, Castle Grant, Grantown, "Countess,"	Reserve Number,

## SECTION 27. HEIFERS calved after 1st January 1871.

1. The Duke of Athole, K.T., Blair Castle, Blair-Athole, "Uallach,"	10 0 0
2. John Stewart, Duntulm, Portree, "Targeal Dhu,"	5 0 0
3. Hugh Mann, Meadowfield, Nairn, "Nannie,"	3 0 0
4. The Earl of Seafield, Castle Grant, Grantown, "Craigellachie,"	Reserve Number,

## SECTION 28. HEIFERS calved after 1st January 1872.

1. John Stewart, Duntulm, Portree, "Targeal Buidhe,"	8 0 0
2. The Duke of Athole, K.T., Blair Castle, Blair-Athole, "Bhuidhe Mhor,"	4 0 0
3. The Earl of Seafield, Castle Grant, Grantown, "Victoria,"	2 0 0
4. C. Macpherson-Campbell of Ballimore, Tighnabruaich, "Example,"	Reserve Number,

## SECTION 29. HEIFERS calved after 1st January 1873.

1. John Stewart, Duntulm, Portree, "Targeal Bheg,"	5 0 0
2. The Earl of Seafield, Castle Grant, Grantown, "Jessie,"	3 0 0
3. The Earl of Seafield, Castle Grant, Grantown, "Flora,"	1 0 0
4. The Earl of Seafield, Castle Grant, Grantown, "Marjory,"	Reserve Number,

Carry forward, L 783 4 0

Brought forward, L.783 4 0

## FAT STOCK.

## SECTION 30. SHORTHORN OXEN calved after 1st January 1871.

1. Robert Bruce, Newton of Struthers, Forbes, . . . . .	6 0 0
2. John Cran, Kirkton, Inverness, . . . . .	3 0 0

## SECTION 31. SHORTHORN OXEN calved after 1st January 1872.

1. Richard H. Harris, Earnhill, Forbes, . . . . .	5 0 0
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## SECTION 32. HIGHLAND OXEN calved after 1st January 1870.

1. Sir William G. Gordon Cumming, of Altyre, Bart., Forbes, . . . . .	6 0 0
2. The Duke of Sutherland, K.G., Dunrobin Castle, . . . . .	3 0 0
3. The Earl of Seafield, Castle Grant, Grantown, . . . . .	Reserve Number,

## SECTION 33. HIGHLAND OXEN calved after 1st January 1871.

1. Sir William G. Gordon Cumming, of Altyre, Bart., Forbes, . . . . .	5 0 0
2. Sir Dudley Coutts Marjoribanks of Gulsachan, Bart., M.P., . . . . .	2 0 0
3. Evan Baillie of Dochfour, Inverness, . . . . .	Reserve Number,

## SECTION 34. OXEN of any other Pure or Cross Breed calved after 1st January 1871.

1. Alexander Matheson of Ardrross, M.P., . . . . .	6 0 0
2. Alexander Munro, Ord, Invergordon, . . . . .	3 0 0
3. J. & W. Martin, Newmarket, Aberdeen, . . . . .	Reserve Number,

## SECTION 35. OXEN of any other Pure or Cross Breed calved after 1st January 1872.

1. J. & W. Martin, Newmarket, Aberdeen, . . . . .	5 0 0
2. John Cran, Kirkton, Inverness, . . . . .	2 0 0
3. William Brown, Linkwood, Elgin, . . . . .	Reserve Number,

## SECTION 36. CROSS-BRED HEIFERS calved after 1st January 1871.

1. George Grant, Pollo, Invergordon, . . . . .	6 0 0
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## SECTION 37. CROSS-BRED HEIFERS calved after 1st January 1872.

1. John Cran, Kirkton, Inverness, . . . . .	5 0 0
2. J. & W. Martin, Newmarket, Aberdeen, . . . . .	2 0 0

## EXTRA CATTLE.

## Highly commended.

Shorthorn Heifer, "Katinka," belonging to Richard H. Harris, Earnhill, Forbes, . . . . .	Silver Medal, 0 16 0
Devon Ox belonging to Richard H. Harris, Earnhill, Forbes, . . . . .	Silver Medal, 0 16 0

## Commended.

Highland Heifer belonging to the Earl of Seafield, Castle Grant, . . . . .	Medium Silver Medal, 0 10 6
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L.844 6 6

## CLASS II.—HORSES.

## FOR AGRICULTURAL PURPOSES.

## SECTION 1. STALLIONS foaled before 1st January 1871.

1. David Riddell, Kilbowie, Duntocher, "Never Mind Him," . . . . .	L.30 0 0
2. John Duncan, Ardo, Methlic, "Young Loine," . . . . .	20 0 0
3. David Riddell, Kilbowie, Duntocher, "Prince Arthur," . . . . .	10 0 0
4. Peter Crawford, Dumgoyack, Strathblane, "Crown Prince," . . . . .	Reserve Number,
Breeder of Best Stallion—W. M'Jannet, Enoch, Maybole, . . . . .	Silver Medal, 0 16 0

## SECTION 2. ENTIRE COLTS foaled after 1st January 1871.

1. David Riddell, Kilbowie, Duntocher, "Honest Sandy," . . . . .	20 0 0
2. Robert Andrews, Allans, Paisley, "Defiance," . . . . .	15 0 0
3. Robert Brewster, Barnbeth, Kilbarchan, "Young Emperor," . . . . .	10 0 0
4. A. M. Ogilvy, Tillynaught, Portsoy, "Young Emulator," . . . . .	Reserve Number.

Carry forward, L.105 16 0

Brought forward, L 105 16 0

## SECTION 3. ENTIRE COLTS foaled after 1st January 1872.

1. Robert Brewster, Barnbeth, Kilbarchan, "The Pride of Scotland,"	15	0	0
2. David Riddell, Kilbowie, Duntocher,	8	0	0
3. Robert Andrews, Allans, Paisley, "Clydesdale Tom,"	4	0	0
4. The Earl of Strathmore, Glamis Castle, Forfar, "The Thane of Glamis,"			

Reserve Number,

## SECTION 4. ENTIRE COLTS foaled after 1st January 1873.

1. David Riddell, Kilbowie, Duntocher,	10	0	0
2. Alexander Weir, Newhouse Mill, Kilbride, "Prince of Kilbride,"	5	0	0
3. William S. Marr, Upper Mill, Tarves, Aberdeen, "British Star,"	3	0	0
4. Sir William G. Gordon Cumming, of Altyre, Bart., Forbes,			

Reserve Number,

## SECTION 5. MARES (with Foal at foot) foaled before 1st January 1871.

1. James Souter, Collic, Orton, Fochabers, "Rose,"	20	0	0
2. Alexander Munro, Ord, Invergordon, "Fanny,"	10	0	0
3. James Lawrence, Thornhill, Forbes, "Bell,"	5	0	0
4. James Lawrence, Thornhill, Forbes, "Lily,"			

Reserve Number,

## SECTION 6. MARES (in Foal) foaled before 1st January 1871.

1. Robert Murdoch, Hallside, Newton, Cambuslang, "Maggie,"	20	0	0
2. Archibald K. Leitch, Inchstelly, Forbes, "Queen,"	10	0	0
3. Andrew Montgomery, Boreland, Castle Douglas, "Nanny,"	5	0	0
4. John Hendrie, Castle Heather, Inverness, "Dandy,"			

Reserve Number,

## SECTION 7. FILLIES foaled after 1st January 1871.

1. Alexander Buchanan, Garscadden Mains, New Kilpatrick, "Bell,"	10	0	0
2. Peter Beattie, Dunnydeer, Inch, "Queen,"	5	0	0
3. Evan Bailhe of Dochfour, Inverness, "Nelly,"	5	0	0
4. Alexander Munro, Ord, Invergordon, "Blase,"			

Reserve Number,

## SECTION 8. FILLIES foaled after 1st January 1872.

1. William H. Hardie, Borrowstown Mains, Linlithgow, "Rance,"	8	0	0
2. The Earl of Strathmore, Glamis Castle, Forfar, "Bell,"	4	0	0
3. James R. Mitchell, Drynie, Inverness, "Blossom,"	2	0	0
4. Peter Beattie, Dunnydeer, Inch, "Blossom,"			

Reserve Number,

## SECTION 9. FILLIES foaled after 1st January 1873.

1. Henry D. Adamson, Balquharn, Alford, "Blossom,"	6	0	0
2. The Earl of Strathmore, Glamis Castle, Forfar, "Maggie,"	3	0	0
3. D. G. Forbes of Millburn, Inverness, "Nelly,"	1	0	0

## SECTION 10. DRAUGHT GELDINGS foaled after 1st January 1871.

No award.

## SECTION 11. DRAUGHT GELDINGS foaled after 1st January 1872.

1. John Miller, Seafeld, Cullen, "Clyde,"	6	0	0
2. D. G. C. Scott, Parks of Inshes, Inverness, "Smiler,"	3	0	0
3. James Macleannan, Fornightly, Nairn, "Frank,"	1	0	0

## HUNTERS AND ROADSTERS.

## SECTION 12. MARES or GELDINGS suitable for field, foaled before 1st January 1871.

1. Myles Edward Mather, Glen-Druith, Inverness, "Sir Roger,"	20	0
2. A. M. Mackintosh of Mackintosh, Moyhall, Inverness, "Pat,"	10	0
3. Robert Walker, Altyre, Forbes, "Higham,"	5	0

## SECTION 13. MARES or GELDINGS suitable for carriage, foaled before 1st January 1871.

1. A. M. Clarke, Meddat, Parkhill, "Stanley,"	20	0
2. Robert Walker, Altyre, Forbes, "Collairnie,"	10	0
3. Sir Dudley Courtts Marjoribanks of Guisachan, Bart., M.P., Beauly, "Sunflower,"	5	0

## SECTION 14. MARES or GELDINGS suitable as Hackneys or Roadsters, between 14 and 15 hands high.

1. Sir Dudley Courtts Marjoribanks of Guisachan, Bart., M.P., Beauly, "Routcake,"	8	0
2. A. G. Dallas, Dunain, Inverness, "Kitty,"	4	0
3. Sir Dudley Courtts Marjoribanks of Guisachan, Bart., M.P., Beauly, "Sheldrake,"	2	0

Carry forward, L 356 16 0

Brought forward, L.356 16 0

## PONIES.

## SECTION 15. MARES or GELDINGS between 13 and 14 hands high.

1. Sir Dudley Coutts Marjoribanks of Guisachan, Bart., M.P., Beauly, "Trifle,"	6	0	0
2. Duncan A. Macrae, Fernaig, Strome Ferry, "Mhari Oig,"	3	0	0
3. Myles Edward Mather, Glen-Druidh, Inverness, "Daphne,"	1	0	0

## SECTION 16. MARES or GELDINGS between 12 and 13 hands high.

1. Fountaine Walker, Ness Castle, Inverness, "Bounty,"	6	0	0
2. T. P. B. Biscoe, Newton, Inverness, "Weaver,"	3	0	0
3. A. G. Dallas, Dunain, Inverness, "Jet,"	1	0	0

## SECTION 17. ENTIRE STALLIONS, 12 hands and under.

1. Miss Augusta Norton, Rannoch Lodge, Pitlochry, "Little Benjamin,"	.	.	6	0	0
2. The Hon. Lady Menzies, Rannoch Lodge, Pitlochry, "Tom,"	.	.	3	0	0
3. The Hon. Lady Menzies, Rannoch Lodge, Pitlochry, "Jerry,"	.	.	1	0	0
Thomas Edmonstone of Bunes, Lerwick, "Balta,"	.	Silver Medal,	0	16	0
Joseph Leask, jun., Lerwick, "Little Viking,"	.	Silver Medal,	0	16	0

## SECTION 18. MARES or GELDINGS, 12 hands and under.

1. Eneas Mackintosh of Daviot, Inverness, "Pic-nic,"	6	0	0
2. Lauchlan Maclean, V.S., Inverness,	3	0	0
3. Robert Anderson of Lochdhu, Nairn, "Prince Charlie,"	1	0	0

## THOROUGHBRED STALLION.

Thomas Bland, Greystone, Alford, Aberdeenshire, "Blucher,"	50	0	0
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## EXTRA HORSES.

## Highly Commended.

Half-bred Gelding, belonging to Duncan Davidson of Tulloch, Dingwall,	Silver Medal,	0	16	0
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Half-bred Mare, belonging to Duncan Davidson of Tulloch, Dingwall,	Silver Medal,	0	16	0
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## Commended.

Cross-bred Stallion, "Pride of Badenoch," belonging to John Cameron, Kingussie.	Medium Silver Medal,	0	10	6
		L.450	10	6

## CLASS III.—SHEEP.

## CHEVIOT.

## SECTION 1. TUPS above 1 Shear.

1. Thomas Welsh, Ericstane, Moffat,	L.12	0	0
2. James Archibald, Glengelt, Lauder,	6	0	0
3. John A. Johnstone, Archbank, Moffat,	3	0	0
4. James Brydon, Kinnelhead, Moffat,	Reserve Number,		

## SECTION 2. DINMONT or SHEARLING TUPS.

1. John A. Johnstone, Archbank, Moffat,	12	0	0
2. John A. Johnstone, Archbank, Moffat,	6	0	0
3. James Brydon, Kinnelhead, Moffat,	3	0	0
4. John A. Johnstone, Archbank, Moffat,	Reserve Number,		

## SECTION 3. Pens of 5 EWES above 1 Shear, with Lambs.

1. James Brydon, Kinnelhead, Moffat,	10	0	0
2. William Mitchell, Ribigill, Tongue, Lairg,	5	0	0
3. Thomas Elliot, Hindhope, Jedburgh,	2	0	0
4. David Mundell, Strathbrian, Dingwall,	Reserve Number,		
Lambs—1. Thomas Elliot, Hindhope, Jedburgh,	2	0	0
2. James Brydon, Kinnelhead, Moffat,	1	0	0

## SECTION 4. Pens of 5 SHEARLING EWES or GIMMERS.

1. James Archibald, Glengelt, Lauder,	10	0	0
2. James Brydon, Kinnelhead, Moffat,	5	0	0
3. Thomas Elliot, Hindhope, Jedburgh,	2	0	0
4. William Mitchell, Ribigill, Tongue, Lairg,	Reserve Number,		

Carry forward, L.79 0 0

Brought forward, L.79 0 0

## BLACKFACED.

## SECTION 5. TUPS above 1 Shear.

1. John Archibald, Overshiels, Stow,	.	.	.	.	.	12	0	0
2. John Archibald, Overshiels, Stow,	.	.	.	.	.	6	0	0
3. James Greenshields, West Town, Lesmahagow,	.	.	.	.	.	3	0	0
4. James Greenshields, West Town, Lesmahagow,	.	.	.	.	Reserve Number,			

## SECTION 6. DINMONT or SHEARLING TUPS.

1. John Archibald, Overshiels, Stow,	.	.	.	.	.	12	0	0
2. James Greenshields, Westown, Lesmahagow,	.	.	.	.	.	6	0	0
3. John Archibald, Overshiels, Stow,	.	.	.	.	.	3	0	0
4. James Greenshields, Westown, Lesmahagow,	.	.	.	.	Reserve Number,			

## SECTION 7. Pens of 5 EWES above 1 Shear, with Lambs.

1. John Archibald, Overshiels, Stow,	.	.	.	.	.	10	0	0
2. John Archibald, Overshiels, Stow,	.	.	.	.	.	5	0	0
3. James Macpherson, Clunas, Cawdor, Nairn,	.	.	.	.	.	2	0	0
4. James Macpherson, Clunas, Cawdor, Nairn,	.	.	.	.	Reserve Number,			
Lambs—1. John Archibald, Overshiels, Stow,	.	.	.	.	.	2	0	0
2. John Archibald, Overshiels, Stow,	.	.	.	.	.	1	0	0

## SECTION 8. Pens of 5 SHEARLING EWES or GIMMERS.

1. John Archibald, Overshiels, Stow,	.	.	.	.	.	10	0	0
2. John Archibald, Overshiels, Stow,	.	.	.	.	.	5	0	0
3. Peter Robertson, Achilty, Dingwall,	.	.	.	.	.	2	0	0
4. James Macpherson, Clunas, Cawdor, Nairn,	.	.	.	.	Reserve Number,			

## BORDER LEICESTER.

## SECTION 9. TUPS above 1 Shear.

1. Thomas Forster, junior, Ellingham, Chathill,	.	.	.	.	.	12	0	0
2. Captain A. J. C. Warrand, Ferrintosh, Dingwall,	.	.	.	.	.	6	0	0
3. Captain A. J. C. Warrand, Ferrintosh, Dingwall,	.	.	.	.	.	3	0	0
4. Captain A. J. C. Warrand, Ferrintosh, Dingwall,	.	.	.	.	Reserve Number,			

## SECTION 10. DINMONT or SHEARLING TUPS.

1. George Torrance, Sisterpath, Dunse,	.	.	.	.	.	12	0	0
2. George Torrance, Sisterpath, Dunse,	.	.	.	.	.	6	0	0
3. Andrew Smith, Castlemains, Gifford,	.	.	.	.	.	3	0	0
4. George Torrance, Sisterpath, Dunse,	.	.	.	.	Reserve Number,			

## SECTION 11. Pens of 5 EWES above 1 Shear.

1. Thomas Simson, Blainslie, Lauder,	.	.	.	.	.	10	0	0
2. James Nisbet, Lambden, Greenlaw, Dunse,	.	.	.	.	.	5	0	0
3. Sir George Dunbar of Hempriggs, Bart., Wick,	.	.	.	.	.	2	0	0

## SECTION 12. Pens of 5 SHEARLING EWES or GIMMERS.

1. George Torrance, Sisterpath, Dunse,	.	.	.	.	.	10	0	0
2. John Hunter, Dipple, Fochabers,	.	.	.	.	.	5	0	0
3. Sir George Dunbar of Hempriggs, Bart., Wick,	.	.	.	.	.	2	0	0
4. James Nisbet, Lambden, Greenlaw, Dunse,	.	.	.	.	Reserve Number,			

## LONG-WOOLLED OTHER THAN BORDER LEICESTER.

## SECTION 13. TUPS above 1 Shear.

1. John Gibson, Woolmet, Dalkeith,	.	.	.	.	.	8	0	0
2. Eric Sutherland, Tannachie House, Fochabers,	.	.	.	.	.	4	0	0
3. Lord Kinnaird, K.T., Rossie Priory, Inchtute,	.	.	.	.	.	2	0	0

## SECTION 14. DINMONT or SHEARLING TUPS.

1. John Gibson, Woolmet, Dalkeith,	.	.	.	.	.	8	0	0
2. Eric Sutherland, Tannachie House, Fochabers,	.	.	.	.	.	4	0	0

## SECTION 15. Pens of 5 EWES above 1 Shear.

1. John Gibson, Woolmet, Dalkeith,	.	.	.	.	.	6	0	0
2. Eric Sutherland, Tannachie House, Fochabers,	.	.	.	.	.	3	0	0

## SECTION 16. Pens of 5 SHEARLING EWES or GIMMERS.

1. John Gibson, Woolmet, Dalkeith,	.	.	.	.	.	6	0	0
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Carry forward, L.275 0 0

## SOUTHDOWN.

Brought forward, L.275 0 0

## SECTION 17. TUPS of any age.

- |   |       |
|---|-------|
| 1. Jeremiah James Colman, M.P., Easton Lodge Farm, Norwich, . . . . . | 8 0 0 |
| 2. Jeremiah James Colman, M.P., Easton Lodge Farm, Norwich, . . . . . | 4 0 0 |

## SECTION 18. Pens of 5 EWES of any age, or GIMMERS.

- |   |       |
|---|-------|
| 1. Jeremiah James Colman, M.P., Easton Lodge Farm, Norwich, . . . . . | 6 0 0 |
|---|-------|

## SHROPSHIRE.

## SECTION 19. TUPS of any age.

- |   |       |
|---|-------|
| 1. No Award, . . . . .                                      |       |
| 2. The Earl of Strathmore, Glamis Castle, Forfar, . . . . . | 4 0 0 |
| 3. Eric Sutherland, Tannachie House, Fochabers, . . . . .   | 2 0 0 |

## SECTION 20. Pens of 5 EWES of any age, or GIMMERS.

- |   |       |
|---|-------|
| 1. The Earl of Strathmore, Glamis Castle, Forfar, . . . . . | 6 0 0 |
| 2. John Gibson, Woolmet, Dulkeith, . . . . .                | 3 0 0 |
| 3. The Earl of Strathmore, Glamis Castle, Forfar, . . . . . | 1 0 0 |

## SHORT-WOOLLED OTHER THAN SOUTHDOWN AND SHROPSHIRE.

## SECTION 21. TUPS of any age.—No Entry.

## SECTION 22. Pens of 5 EWES of any age, or GIMMERS.—No Entry.

## EXTRA SECTIONS.

## SECTION 23. Pens of 5 CHEVIOT WETHERS, not above 3 Shear.

- |  |       |
|--|-------|
| 1. The Duke of Sutherland, K.G., Dunrobin Castle, Golspie, . . . . . | 4 0 0 |
| 2. The Duke of Sutherland, K.G., Dunrobin Castle, Golspie, . . . . . | 2 0 0 |

## SECTION 24. Pens of 5 BLACKFACED WETHERS, not above 4 Shear.

- |  |       |
|--|-------|
| 1. J. & W. Martin, New Market, Aberdeen, . . . . .           | 4 0 0 |
| 2. The Earl of Seafield, Balmacaan, Drumnadrochit, . . . . . | 2 0 0 |

## SECTION 25. Pens of 5 HALF-BRED HOGGS, not above 1 Shear.—No Entry.

## SECTION 26. Pens of 5 GREYFACED HOGGS, not above 1 Shear.—No Entry.

## SECTION 27. Pens of 5 WETHER HOGGS of any Cross, not above 1 Shear.

- |  |       |
|--|-------|
| 1. Sir William G. Gordon Cumming of Altyre, Bart., Forres, . . . . . | 4 0 0 |
| 2. Eric Sutherland, Tannachie House, Fochabers, . . . . .            | 2 0 0 |

L.327 0 0

## GOATS.

## Commended.

- |  |        |
|--|--------|
| A Buck Goat, belonging to the Hon. Lady Menzies, Rannoch Lodge, Pitlochry, . . . . . | 0 10 6 |
| Medium Silver Medal, . . . . .   |        |

L 0 10 6

## CLASS IV.—SWINE.

## SECTION 1. BOARS, Large Breed.

- |  |         |
|--|---------|
| 1. R. E. Duckering, Northorpe, Kirtou Lindsey, . . . . .     | L.3 0 0 |
| 2. D. H. C. R. Davidson, yr of Tulloch, Lochbroom, . . . . . | 4 0 0   |
| 3. William Macdonald, Woodlands, Perth, . . . . .            | 2 0 0   |

## SECTION 2. BOARS, Small Breed.

- |  |                 |
|--|-----------------|
| 1. R. E. Duckering, Northorpe, Kirtou Lindsey, . . . . . | 8 0 0           |
| 2. John Moir Clark, Garthdee, Aberdeen, . . . . .        | 4 0 0           |
| 3. John Moir Clark, Garthdee, Aberdeen, . . . . .        | 2 0 0           |
| 4. John Moir Clark, Garthdee, Aberdeen, . . . . .        | Reserve Number, |

Carry forward, L.25 0 0

Brought forward, L.2S 0 0

## SECTION 3. SOWS, Large Breed.

1. R. E. Duckering, Northorpe, Kirton Lindsey,	6 0 0
2. John Moir Clark, Garthdee, Aberdeen, .	3 0 0
3. William Macdonald, Woodlands, Perth, .	1 0 0
4. William Macdonald, Woodlands, Perth, .	Reserve Number,

## SECTION 4. SOWS, Small Breed.

1. John Moir Clark, Garthdee, Aberdeen, . . . . .	
2. R. E. Duckering, Northorpe, Kirton Lindsey, . . . . .	
3. The Hon. Lady Menzies, Rannoch Lodge, Pitlochry, . . . . .	
4. John Moir Clark, Garthdee, Aberdeen, . . . . .	Reserve Number,

## SECTION 5. Pens of 3 PIGS not above 8 months old, Large Breed.

1. John Moir Clark, Garthdee, Aberdeen, . . . . .	
2. R. E. Duckering, Northorpe, Kirton Lindsey, . . . . .	
3. William Macdonald, Woodlands, Perth, . . . . .	

## SECTION 6. Pens of 3 PIGS not above 8 months old, Small Breed.

1. John Moir Clark, Garthdee, Aberdeen, . . . . .	4 0 0
2. Lord Lovat, K.T., Beaufort Castle, Beaully, . . . . .	2 0 0

L.61 0 0

## CLASS V.—COLLIE DOGS.

## SECTION 1. DOGS not exceeding six years old.

1. Robert Bruce, Newton of Struthers, Forbes, "Glen,"	L.2 0 0
2. Sir George Macpherson-Grant of Ballindalloch, Bart, "Glen,"	1 0 0

## SECTION 2. BITCHES not exceeding six years old.

1. John Sinclair, Kintessack, Forbes, "Glen," . . . . .	2 0 0
2. John Ogilvy, Rosevalley, Elgin, "Bessie," . . . . .	1 0 0

L.6 0 0

## CLASS VI.—POULTRY.

## SECTION 1. DORKING, Silver Grey—Cock.

1. Lord Lovat, K.T., Beaufort Castle, Beaully, . . . . .	L.1 0 0
2. James Mollison, Dochgarroch Lodge, Inverness, . . . . .	0 10 0

## SECTION 2. DORKING, Silver Grey—2 Hens.

1. Miss E. Taylor, Fichnie, Kinellar, Blackburn, Aberdeen, . . . . .	1 0 0
2. Mrs Brodie of Lethen, Lethen House, Nairn, . . . . .	0 10 0

## SECTION 3. DORKING, Silver Grey—Cockerel.

1. Peter Gray, Viewhill, Cawdor, Nairn, . . . . .	1 0 0
2. Lady Mackenzie, Conan House, Dingwall, . . . . .	0 10 0

## SECTION 4. DORKING, Silver Grey—2 Pullets.

1. Miss E. Taylor, Fichnie, Kinellar, Blackburn, Aberdeen, . . . . .	1 0 0
2. Evan Baillie of Dochfour, Inverness, . . . . .	0 10 0

## SECTION 5. DORKING, Coloured—Cock.

1. James Clark, Fochabers, . . . . .	1 0 0
2. William Ferguson, Primrose Villa, Inverness, . . . . .	0 10 0

## SECTION 6. DORKING, Coloured—2 Hens.

1. James Clark, Fochabers, . . . . .	1 0 0
2. William Ferguson, Primrose Villa, Inverness, . . . . .	0 10 0

## SECTION 7. DORKING, Coloured—Cockerel.

1. William Ferguson, Primrose Villa, Inverness, . . . . .	1 0 0
2. James Clark, Fochabers, . . . . .	0 10 0

## SECTION 8. DORKING, Coloured—2 Pullets.

1. Lady Macpherson-Grant, Ballindalloch Castle, Ballindalloch, . . . . .	1 0 0
2. James Clark, Fochabers, . . . . .	0 10 0

Carry forward, L.12 0 0

Brought forward, L.12 0 0

## SECTION 9. COCHIN-CHINA—Cock.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 10. COCHIN-CHINA—2 Hens.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 11. COCHIN-CHINA—Cockerel.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 12. COCHIN-CHINA—2 Pullets.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 13. BRAMAHPOOTRA—Cock.

1. John Stuart, Thistlebank, Helensburgh, . . . . .	1 0 0
2. John Stuart, Thistlebank, Helensburgh, . . . . .	0 10 0

## SECTION 14. BRAMAHPOOTRA—2 Hens.

1. John Stuart, Thistlebank, Helensburgh, . . . . .	1 0 0
2. John Stuart, Thistlebank, Helensburgh, . . . . .	0 10 0

## SECTION 15. BRAMAHPOOTRA—Cockerel.

1. John Young, Hailes Cottage, Slateford, . . . . .	1 0 0
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## SECTION 16. BRAMAHPOOTRA—2 Pullets.

1. John Young, Hailes Cottage, Slateford, . . . . .	1 0 0
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## SECTION 17. SPANISH—Cock.

1. James Souter, Barry Road, Carnoustie, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 18. SPANISH—2 Hens.

1. James Souter, Barry Road, Carnoustie, . . . . .	1 0 0
2. James Hay, Den Cottage, Keith, . . . . .	0 10 0

## SECTION 19. SPANISH—Cockerel.

1. James Norval, Alloa Park, Alloa, . . . . .	1 0 0
2. Archibald Hannan, 8 Baldrige Burn, Dumfermline, . . . . .	0 10 0

## SECTION 20. SPANISH—2 Pullets.

1. James Norval, Alloa Park, Alloa, . . . . .	1 0 0
2. David Kidd, Kinloch Street, Carnoustie, . . . . .	0 10 0

## SECTION 21. SCOTCH GREY—Cock.

1. Charles Gray, V.S., Wishaw, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 22. SCOTCH GREY—2 Hens.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1 0 0
2. Charles Gray, V.S., Wishaw, . . . . .	0 10 0

## SECTION 23. SCOTCH GREY—Cockerel.

1. Charles Gray, V.S., Wishaw, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 24. SCOTCH GREY—2 Pullets.

1. Charles Gray, V.S., Wishaw, . . . . .	1 0 0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0 10 0

## SECTION 25. HAMBURG, Pencilled—Cock.

1. Archibald Hannan, 8 Baldrige Burn, Dumfermline, . . . . .	1 0 0
2. D. G. Forbes of Millburn, Inverness, . . . . .	0 10 0

## SECTION 26. HAMBURG, Pencilled—2 Hens.

1. D. G. Forbes of Millburn, Inverness, . . . . .	1 0 0
---	-------

Carry forward, L.37 10 0



Brought forward,

## SECTION 27. HAMBURG, Pencilled—Cockerel

1. George Caithness, Dundee Street, Carnoustie, . . . . .	1	0	0
2. James Ness, Pathhead, Fife, . . . . .	0	10	0

## SECTION 28. HAMBURG, Pencilled—2 Pullets.

1. George Caithness, Dundee Street, Carnoustie, . . . . .	1	0	0
2. James Ness, Pathhead, Fife, . . . . .	0	10	0

## SECTION 29. HAMBURG, Spangled—Cock.

1. John Macandrew, jun., Dundee Street, Carnoustie, . . . . .	1	0	0
2. Mrs Robert Frew, Kirkcaldy, . . . . .	0	10	0

## SECTION 30. HAMBURG, Spangled—2 Hens.

1. William Ferguson, Primrose Villa, Inverness, . . . . .	1	0	0
2. Miss Augusta Norton, Rannoch Lodge, Pitlochry, . . . . .	0	10	0

## SECTION 31. HAMBURG, Spangled—Cockerel.

1. Joseph M. Campbell, Bonnykelly, New Byth, Turriff, . . . . .	1	0	0
2. George Low, South Kinloch Street, Carnoustie, . . . . .	0	10	0

## SECTION 32. HAMBURG, Spangled—2 Pullets.

1. Joseph M. Campbell Bonnykelly, New Byth, Turriff, . . . . .	1	0	0
2. John Macandrew, jun., Dundee Street, Carnoustie, . . . . .	0	10	0

## SECTION 33. POLISH—Cock.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1	0	0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0	10	0

## SECTION 34. POLISH—2 Hens.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1	0	0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0	10	0

## SECTION 35. POLISH—Cockerel.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1	0	0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0	10	0

## SECTION 36. POLISH—2 Pullets.

1. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	1	0	0
2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0	10	0

## SECTION 37. GAME, Black or Brown Reds—Cock.

1. David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	1	0	0
2. William Ferguson, Primrose Villa, Inverness, . . . . .	0	10	0

## SECTION 38. GAME, Black or Brown Reds—1 Hen.

1. David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	1	0	0
2. David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	0	10	0

## SECTION 39. GAME, Black or Brown Reds—Cockerel

1. Alexander Frew, Kirkcaldy, . . . . .	1	0	0
2. T. W. Mitchell, 202 High Street, Perth, . . . . .	0	10	0

## SECTION 40. GAME, Black or Brown Reds—1 Pullet.

1. William Ferguson, Primrose Villa, Inverness, . . . . .	1	0	0
2. William Henderson, Tayport, Fife, . . . . .	0	10	0

## SECTION 41. GAME, Duckwings—Cock.

1. David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	1	0	0
2. David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	0	10	0

## SECTION 42. GAME, Duckwings—1 Hen.

1. David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	1	0	0
2. D. G. Forbes of Millburn, Inverness, . . . . .	0	10	0

## SECTION 43. GAME, Duckwings—Cockerel.

1. Alexander Dawson, West-End, Forres, . . . . .	1	0	0
2. David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	0	10	0

Carry forward, L.63 0 0

		Brought forward,	L.63	0	0
SECTION 44. GAME, Duckwings—1 Pullet.					
1.	Alexander Dawson, West-End, Forbes, . . . . .	1	0	0	
2.	David Harley, Rosebank House, Bonnington Road, Edinburgh, . . . . .	0	10	0	
SECTION 45. BANTAMS, Game—Cock.					
1.	Sir George Macpherson Grant of Ballindalloch, Bart., . . . . .	1	0	0	
2.	Alexander Frew, Kirkcaldy, . . . . .	0	10	0	
SECTION 46. BANTAMS, Game—1 Hen.					
1.	Sir George Macpherson Grant of Ballindalloch, Bart, . . . . .	1	0	0	
2.	Robert Frew, Sinclairtown, Kirkcaldy, . . . . .	0	10	0	
SECTION 47. BANTAMS, Game—Cockerel.					
1.	Miss B. P. Frew, Kirkcaldy, . . . . .	1	0	0	
2.	A. Stephen, Blairgowrie, . . . . .	0	10	0	
SECTION 48. BANTAMS, Game—1 Pullet.					
1.	Miss Rachel Clark Frew, Kirkcaldy, . . . . .	1	0	0	
2.	Miss Jane M. Frew, Kirkcaldy, . . . . .	0	10	0	
SECTION 49. BANTAMS, Sebright—Cock.					
1.	Miss B. P. Frew, Kirkcaldy . . . . .	1	0	0	
2.	Miss Robina Frew, Kirkcaldy, . . . . .	0	10	0	
SECTION 50. BANTAMS, Sebright—2 Hens.					
1.	Mrs Frew, Skirling, Biggar, . . . . .	1	0	0	
2.	Miss Rachel Clark Frew, Kirkcaldy, . . . . .	0	10	0	
SECTION 51. BANTAMS, Sebright—Cockerel.					
1.	Miss Jane M. Frew, Sinclairtown, Kirkcaldy, . . . . .	1	0	0	
SECTION 52. BANTAMS, Sebright—2 Pullets.					
1.	Alex. Frew, Kirkcaldy, . . . . .	1	0	0	
SECTION 53. BANTAMS, any other variety—Cock.					
1.	James Mollison, Dochgarroch Lodge, Inverness (Black), . . . . .	1	0	0	
2.	Miss B. P. Frew, Kirkcaldy, . . . . .	0	10	0	
SECTION 54. BANTAMS, any other variety—2 Hens.					
1.	Miss R. C. Frew, Kirkcaldy, . . . . .	1	0	0	
2.	Andrew Dougall, Strawberry Hill, Inverness (Black-breasted Red), . . . . .	0	10	0	
SECTION 55. BANTAMS, any other variety—Cockerel					
1.	Miss Robina Frew, Skirling, Biggar, . . . . .	1	0	0	
SECTION 56. BANTAMS, any other variety—2 Pullets.					
1.	Alexander Frew, Riccarton, Kilmainock, . . . . .	1	0	0	
SECTION 57. POULTRY, any other Pure Breed—Cock.					
1.	Mrs Robert Frew, Kirkcaldy (Creve Cœur), . . . . .	1	0	0	
2.	Richard Little, Dickstree, Longtown (Malay), . . . . .	0	10	0	
SECTION 58. POULTRY, any other Pure Breed—2 Hens.					
1.	Miss Robina Frew, Kirkcaldy (Creve Cœur), . . . . .	1	0	0	
SECTION 59. POULTRY, any other Pure Breed—Cockerel.					
1.	Miss P. B. Frew, Kirkcaldy (Creve Cœur), . . . . .	1	0	0	
2.	Mrs John Hendrie, Castle Heather, Inverness (Creve Cœur), . . . . .	0	10	0	
SECTION 60. POULTRY, any other Pure Breed—2 Pullets.					
1.	Mrs John Hendrie, Castle Heather, Inverness (Creve Cœur), . . . . .	1	0	0	
2.	Robert Frew, Sinclairtown, Kirkcaldy (Creve Cœur), . . . . .	0	10	0	
SECTION 61. DUCKS—White Aylesbury—Drake.					
1.	Lady Mackenzie, Conan House, Dingwall, . . . . .	1	0	0	
2.	Mrs John Hendrie, Castle Heather, Inverness, . . . . .	0	10	0	

Carry forward, L.87 10 0

Brought forward, L 87 10 0

## SECTION 62. DUCKS—White Aylesbury—2 Ducks.

- |   |        |
|---|--------|
| 1. Mrs John Hendrie, Castle Heather, Inverness, . . . . . | 1 0 0  |
| 2. George Bruce, Keig, Aberdeenshire, . . . . .           | 0 10 0 |

## SECTION 63. DUCKS—White Aylesbury—Drake (Young).

- |  |        |
|--|--------|
| 1. William Pattie, Castleyards, Torthorwald, Dumfries, . . . . . | 1 0 0  |
| 2. George Bruce, Keig, Aberdeenshire, . . . . .                  | 0 10 0 |

## SECTION 64. DUCKS—White Aylesbury—2 Ducklings.

- |  |        |
|--|--------|
| 1. William Pattie, Castleyards, Torthorwald, Dumfries, . . . . . | 1 0 0  |
| 2. Mrs John Hendrie, Castle Heather, Inverness, . . . . .        | 0 10 0 |

## SECTION 65. DUCKS—Rouen—Drake.

- |  |        |
|--|--------|
| 1. Alexander Taylor, Fechnie, Kinellar, Blackburn, . . . . . | 1 0 0  |
| 2. Duncan Forbes, Culloiden House, Inverness, . . . . .      | 0 10 0 |

## SECTION 66. DUCKS—Rouen—2 Ducks.

- |   |       |
|---|-------|
| 1. Duncan Forbes, Culloiden House, Inverness, . . . . . | 1 0 0 |
|---|-------|

## SECTION 67. DUCKS—Rouen—Drake (Young).—No Award.

## SECTION 68. DUCKS—Rouen—2 Ducklings.

- |   |       |
|---|-------|
| 1. Duncan Forbes, Culloiden House, Inverness, . . . . . | 1 0 0 |
|---|-------|

## SECTION 69. DUCKS—Any other Pure Breed—Drake.

- |  |        |
|--|--------|
| 1. Roderick MacLennan, Bechwood, Inverness (Muscovy), . . . . .      | 1 0 0  |
| 2. Lord Lovat, K.T., Beaufort Castle, Beaulieu (American), . . . . . | 0 10 0 |

## SECTION 70. DUCKS—Any other Pure Breed—2 Ducks.

- |  |        |
|--|--------|
| 1. Lord Lovat, K.T., Beaufort Castle, Beaulieu (American), . . . . . | 1 0 0  |
| 2. Miss Augusta Norton, Rannoch Lodge, Pitlochry (Black), . . . . .  | 0 10 0 |

## SECTION 71. DUCKS—Any other Pure Breed—Drake (Young).—No Entry.

## SECTION 72. DUCKS—Any other Pure Breed—2 Ducklings.—No Entry.

## SECTION 73. TURKEYS—Black Norfolk—Cock.—No Entry.

## SECTION 74. TURKEYS—Black Norfolk—2 Hens.—No Entry.

## SECTION 75. TURKEYS—Black Norfolk—Cock (Poult).—No Entry.

## SECTION 76. TURKEYS—Black Norfolk—2 Hens (Poults).—No Entry.

## SECTION 77. TURKEYS—Any other Breed—Cock.

- |   |        |
|---|--------|
| 1. Miss Augusta Norton, Rannoch Lodge, Pitlochry (American Bronze), . . . . . | 1 0 0  |
| 2. Richard H. Harris, Earnhill, Forbes (Cambridge), . . . . .                 | 0 10 0 |

## SECTION 78. TURKEYS—Any other Breed—2 Hens.

- |   |        |
|---|--------|
| 1. Lady Mackenzie, Conan House, Dingwall (Cambridge), . . . . . | 1 0 0  |
| 2. Lady Mackenzie, Conan House, Dingwall (Cambridge), . . . . . | 0 10 0 |

## SECTION 79. TURKEYS—Any other Breed—Cock (Poult).

- |   |       |
|---|-------|
| 1. George Bruce, Keig, Aberdeenshire (Cambridge), . . . . . | 1 0 0 |
|---|-------|

## SECTION 80. TURKEYS—Any other Breed—2 Hens (Poults).—No Award.

## SECTION 81. GEESE—Grey Toulouse—Gander.

- |   |       |
|---|-------|
| 1. Richard H. Harris, Earnhill, Forbes, . . . . . | 1 0 0 |
|---|-------|

## SECTION 82. GEESE—Grey Toulouse—2 Geese.—No Entry.

## SECTION 83. GEESE—Grey Toulouse—Gander (Young).—No Entry.

## SECTION 84. GEESE—Grey Toulouse—2 Goslings.—No Entry.

## SECTION 85. GEESE—Embsden—Gander.

- |   |       |
|---|-------|
| 1. Roderick MacLennan, Bechwood, Inverness, . . . . . | 1 0 0 |
|---|-------|

## SECTION 86. GEESE—Embsden—2 Geese.—No Entry.

## SECTION 87. GEESE—Embsden—Gander (Young).—No Entry.

## SECTION 88. GEESE—Embsden—2 Goslings.—No Entry.

Carry forward, L 104 10 0

			Brought forward,	L.104	10	0
SECTION 89. GEESE—Any other Pure Breed—Gander.						
1.	Lady Mackenzie, Conan House, Dingwall (Saddle-backed),	.	.	1	0	0
2.	Lady Mackenzie, Conan House, Dingwall (Saddle-backed),	.	.	0	10	0
SECTION 90. GEESE—Any other Pure Breed—2 Geese.						
1.	Lady Mackenzie, Conan House, Dingwall (Saddle-backed),	.	.	1	0	0
2.	Lady Mackenzie, Conan House, Dingwall (Saddle-backed),	.	.	0	10	0
SECTION 91. GEESE—Any other Pure Breed—Gander (Young).						
1.	Lady Mackenzie, Conan House, Dingwall (Saddle-backed),	.	.	1	0	0
2.	D. G. Forbes of Millburn, Inverness (Chinese),	.	.	0	10	0
SECTION 92. GEESE—Any other Pure Breed—2 Goslings.						
1.	Lady Mackenzie, Conan House, Dingwall (Saddle-backed),	.	.	1	0	0
2.	D. G. Forbes of Millburn, Inverness (Chinese),	.	.	0	10	0
PIGEONS.				L.110	10	0

## Highly Commended.

Pouter Pigeons. belonging to D. G. Forbes, of Millburn, Inverness, Silver Medal, 0 16 0

## CLASS VII.—IMPLEMENTS.

Silver Medals were awarded to the following:—

1. Alfred Hughes, Brampton Ash, Market Harborough, Northamptonshire, for Corn Lifters
2. D. M. Osborne & Co., 41 Fox Street, Liverpool, for Kirby's Two-wheeled combined Mower and Reaper.
3. Samuelson & Co., Britannia Works, Banbury, for Patent Original Self-raking Reaper.
4. Walter A. Wood, 36 Worship Street, London, C.E., for New Self-delivery Reaper.
5. Lilie & Elder, Tweedmouth, Berwick-on-Tweed, for Patent Turnip and Mangold Sower.
6. G. W. Murray and Co., Banff Foundry, Banff, for No. 2 "Tiny" Hand-Thrasher, with New Shaker.
7. Naughty & Mackimmie, Carriage Works, Dingwall, for Registered Shaft Adjuster, to suit any size of horse.
8. Picksley, Sims, and Co., Bedford Foundry, Leigh, Lancashire, for General Collection.
9. Richmond & Chandler, Miller Street, Green Gate, Salford, Manchester, for Chaff-cutter, No 65.
10. J. Sellar & Sons, Elgin, for Collection.
11. Thomas Gibson and Son, Bainfield Iron and Wire Works, West Fountainbridge, Edinburgh, for Wrought Iron Field Gate; Framework of T Iron; and Collection.
12. Macfarish & Mackintosh, Implement Merchants, Inverness, for Collection.
13. The Northern Agricultural Implement and Foundry Company (Limited), Thomas B. Pegler, Manager, Inverness, for Collection.
14. John Fowler & Co., Steam Plough Works, Leeds, for Sutherland Apparatus for the Reclamation of Waste Land, and for Collection.
15. Arthur Hope, Victoria Foundry, Edinburgh, for Stone Breaker.
16. Robey & Co (Limited), Perseverance Iron Works, Lincoln, for Collection.

16 Silver Medals, L.12, 16s.

Medium Silver Medals to:—

1. Williamson Brothers, Canal Iron Works, Kendall, for Three horse-power Fixed Combined Thrashing, Shaking, and Winnowing Machine.
2. A. & J. Main & Co., 9 Renfield Street, Glasgow, and 25 George IV. Bridge, Edinburgh, for Star-horse Rake, MD.
3. G. W. Murray & Co., Banff Foundry, Banff, for Turnip Sower.
4. Haughton & Thompson, Carlisle, for New Patent Self-acting Hay Rake and Collection.
5. John Kennedy, Balmacraan, Glen-Urquhart, Inverness, for Straining Posts, &c.
6. Lindsay & Anderson, Lilliehill Fireclay Works, Dunfermline, for Pressure Pipes, and Irrigation Pipes and Collection.
7. Robert Mitchell & Son, Peterhead, for Collection.
8. Thomas Pirie & Co., Kinnmundy, Longside, Aberdeenshire, for Collection
9. Ben. Reid & Co., Bon-Accord Works, Aberdeen, for Collection.
10. George Sellar & Son, Huntly, for Collection.

10 Medium Silver Medals, L.5, 5s.

Minor Silver Medals to—

1. John Crowley & Co., Meadow Hall Iron Works, Sheffield, for Chaff Cutter No. 6.
2. John Unite, 291 Edgware Road, London, for Horse Clothing.

2 Minor Silver Medals, 12s.

## ABSTRACT OF PREMIUMS.

Cattle, . . . . .	L 844	6	6
Horses, . . . . .	450	10	6
Sheep, . . . . .	327	0	0
Goats, . . . . .	0	10	6
Swine, . . . . .	61	0	0
Collie Dogs, . . . . .	6	0	0
Poultry, . . . . .	110	10	0
Pigeons, . . . . .	0	16	0
Implements—			
16 Silver Medals, . . . . .	L 12	16	0
10 Medium Silver Medals, . . . . .	5	5	0
2 Minor Silver Medals, . . . . .	0	12	0
		<hr/>	
		18	13 0

L.1819

## LIST OF JUDGES.

SHORTHORN.—James Reid, Greystone, Alford, Aberdeenshire; John Wood, Harewood Hill, Darlington; Alexander Young, Keir Mains, Dunblane.

POLLED ANGUS OR ABERDEEN.—The Hon. Charles Carnegie; Robert Hampton, Castle Fraser, Aberdeen; George J. Walker, Portlithen, Aberdeen.

GALLOWAY.—Maxwell Clark of Culmain, Crockettford; William Routledge, Elrig, Port-Wilham. Ayrshire.—H. D. B. Hyslop, Tower, Sanquhar; Hugh Kirkwood, Killermont, Maryhill, Glasgow; David Tweedie, Castle Crawford, Abington.

HIGHLAND.—David Foyer, Knowehead, Campsie; John Macarthur, Accurach, Inveraray; Donald Stewart, Achalader, Tyndrum.

FAT STOCK.—Matthew Elliot, fletcher, Inverness; James Geddes, Orbliston, Fochabers; Andrew Mitchell, Alloa.

HORSES FOR AGRICULTURAL PURPOSES.—Samuel Clark, Manswrae, Kilbarchan; John Dove, Cross-hall, Coldstream; Lawrence Drew, Merryton, Hamilton.

HUNTERS, ROADSTERS, AND PONIES.—Andrew Gillon of Wallhouse, Bathgate; James Hope. Duddingston, Edinburgh; Nicol Milne of Faldonside, Melrose.

CHEVIOT.—George Maccall, Burrance, Lockerbie; John Miller, Downreay, Thurso; John Scott, Delorain, Selkirk.

BLACKFACED.—The same as for Highland Cattle.

BORDER LANCHESTER AND OTHER LONG-WOOLLED SHEEP.—Thomas Ferguson, Kinnochtry, Coupar-Angus; Robert Hardie, Harrietfield, Kelso; Thomas Harris, Stoneylane, Bromsgrove.

SOUTHDOWN, SHROPSHIRE, AND OTHER SHORT-WOOLLED SHEEP.—Robert Scot Skirving, Camp-town, Drem; Robert C. Yeoman, Marsk Hall, Marsk-by-the-Sea, Yorkshire.

SWINE.—John Gibson, Woolmet, Dalkeith; Patrick Small Keir of Kindrogan, Pitlochry; P. D. Swinton, Holyn Bank, Haddington.

COLLIE DOGS.—Cluny Macpherson, Cluny Castle, Kingussie; John Blake, Dunrobin Mains, Golspie.

POULTRY.—John Curror of Nivingston, Comiston, Edinburgh; Thomas Raines, Bridgehaugh, Stirling; David Stratton, Middleby Street, Edinburgh.

IMPLEMENTS.—*Society's Inspecting Committee*.—James W. Hunter of Thurston, Chairman of the Society's Machinery Committee; David Stevenson, C.E., Edinburgh, Consulting Engineer to the Society; James D. Park, Edinburgh, Practical Engineer to the Society; Professor Wilson, Edinburgh; John Munro, Fairmington, Kelso; Thomas Mylne, Niddrie Mains, Edinburgh; Robert Wilson, Durn, Perth; Robert Hutchison of Carlourie, Kirkliston. *Local Committee*.—The Duke of Sutherland, K.G.; The Earl of Caithness; Captain Fraser of Balnain, Farraline, Gorthlick; Colonel Inglis, of Kingsmills, Inverness; John Peter, Croyard, Beanly; Robert Walker, Altyre, Forres; James Geddes, Orbliston, Fochabers.

## LIST OF ATTENDING MEMBERS.

SHORTHORN.—Colonel Fraser-Tytler of Aldourie, Inverness; John Ferguson, East Grange, Forres.

POLLED ANGUS OR ABERDEEN.—Eneas Mackintosh of Daviot, Inverness; Richard Heath Harris, Earnhill, Forres.

GALLOWAY.—Robert Bruce, Newton of Struthers, Forres; Robert Anderson of Lochdhu, Nairn. Ayrshire.—J. C. J. Brodie of Lethen, Nairn; George Middleton, Cornton, Ferrintosh, Dingwall.

HIGHLAND.—Duncan Davidson of Tulloch, Dingwall; James Macpherson, Clunas, Cawdor.  
 FAT STOCK.—Kenneth Murray of Geanies, Tain; William Cruickshank, Milton, Fort-George.  
 HORSES FOR AGRICULTURAL PURPOSES.—Major Davidson, yr. of Tulloch, Lochbroom; Hugh Fraser, Balloch of Culloden, Inverness.  
 HUNTERS, ROADSTERS, AND PONIES.—James Seton Wightman of Courance, Lockerbie; John Douglas, Calrossie, Parkhill.  
 CHEVIOT.—Arthur Forbes of Culloden, Inverness; D. G. C. Scott, Parks of Inshes, Inverness.  
 BLACKFACED.—E. C. Sutherland Walker of Skibo, Dornoch; Alex. Fraser, Faihie, Inverness.  
 BORDER LEICESTER AND OTHER LONG-WOOLLED SHEEP.—Major Grant, Glen-Urquhart; Walter Attas, Fodderty, Dingwall.  
 SOUTHDOWN, SHROPSHIRE, AND OTHER SHORT-WOOLLED SHEEP.—Donald Cameron of Clunes, Inverness; W. A. Stables, Cawdor Castle, Nairn.  
 SWINE.—Major Horne of Strkoke, Wick; Thomas Yool, Coullartbank, Elgin.  
 COLLIE DOGS.—Dr Maclean, Westfield, Elgin; Peter Robertson, Achilty, Dingwall.  
 POULTRY.—Provost Lyon-Mackenzie of St Martins, Inverness; Dr Mackenzie of Eileanach, Inverness.

## IV.—DISTRICT COMPETITIONS.

## CATTLE.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
<i>Islands of Islay, Jura, and Colonsay</i>	Donald McMillan, Eorobus	Ayrshire Bull, Class I.† L 4 & Med. Sil. Medal	L 4 10 6
	Alex. Fleck, Gartmain	do. do. . . . .	3 0 0
	John Johnston, Tallant	do. do. . . . .	1 0 0
	Sam Mitchell, Nereby	do. Class II.† L 3 & Med. Sil. Medal	3 10 6
	Hugh Stevenson, Laggan	do. do. . . . .	2 0 0
	D. McDonald, Sunderland	do. do. . . . .	1 0 0
	Wm. Gemmel, Cornubus	Ayrshire Heifer L 3 & Med. Sil. Medal	3 10 6
	A. Stewart, Corray	do. . . . .	2 0 0
	El Stevenson, Laggan	do. . . . .	1 0 0
<i>Westside</i>	David Nicol, Upper Anguston	Shorthorn Bull, Class I. L 4 & Med. Sil. Medal	4 10 6
	James Shaw, Tillyching	do. do. . . . .	3 0 0
	Robert Thomson, Terryvale	do. do. . . . .	1 0 0
	James Black, Westhill Mains	do. Class II. L 3 & Med. Sil. Medal	3 10 6
	John Shepherd, Haugh	do. do. . . . .	2 0 0
	Mrs Leighton, Bowbutts	do. do. . . . .	1 0 0
	George Reid, Baads	Polled Heifer L 3 & Med. Sil. Medal	3 10 6
	John Smith, Wester Mains	do. . . . .	2 0 0
	John Smith, Wester Mains	do. . . . .	1 0 0
<i>W. of free</i>	Sir M. R. Shaw Stewart, Bart.	Ayrshire Bull Silver Medal	0 16 0
	Thomas Kerr, East Fulton	do. Class I. L 4 & Med. Sil. Medal	4 10 6
	John Park, Glenshinnoch	do. Class II. L 3 & Med. Sil. Medal	3 10 6
	Wm. Carswell, Craig	do. do. . . . .	2 0 0
	Alex. Love, Kilmalcolm	do. do. . . . .	1 0 0
	Mrs Douglas, Green	Ayrshire Heifer L 3 & Med. Sil. Medal	3 10 6
	Alex. Love, Kilmalcolm	do. . . . .	2 0 0
	Thomas Kerr, East Fulton	do. . . . .	1 0 0
	Alex. Buchanan, Whitehouse	Shorthorn Bull, Class II. L 1, 10s. & Med. Sil. Medal	2 0 0
	A. & J. Christie, Bankend	do. do. . . . .	1 0 0
	Hugh Thomson, Blackgrange	do. do. . . . .	0 10 0
	William Ure, Bogton	Ayrshire Heifer L 3 & Med. Sil. Medal	3 10 6
	Thomas Denholm, Lochgreen	do. . . . .	2 0 0
	Thos. Leishman, Meiklewood	do. . . . .	1 0 0
<i>W. of free</i>	James Scott of Tulloch	Polled Bull Silver Medal	0 16 0
	John Stott, Greenheads	Shorthorn Heifer L 3 & Med. Sil. Medal	3 10 6
	Jas. C. Thom, Quithilhead	do. . . . .	2 0 0
	George Stewart, Craignieston	do. . . . .	1 0 0

Carry forward, L 78 18 0

Half Premiums awarded, the number of Lots being under four.

† Aged Bulls.

\* Two-year old Bulls.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward,	L.78 18 0
<i>East</i>	Lawrence Drew, Merryton	Ayrshire Bull	Silver Medal 0 16 0
<i>Kilbride</i>	Mrs Rodger, Crook	do.	Class I. L.4 & Med. Sil. Medal 4 10 6
	W. Young, Waterbank	do.	do. . . . . 3 0 0
	D. Keir, Bucklyvie	do.	do. . . . . 1 0 0
	Lawrence Drew, Merryton	do.	Class II. L.3 & Med. Sil. Medal 3 10 6
	Lawrence Drew, Merryton	do.	do. . . . . 2 0 0
	J. Morton, Henryton	do.	do. . . . . 1 0 0
	Lawrence Drew, Merryton	Ayrshire Heifer	L.3 & Med. Sil. Medal 3 10 6
	R. Murdoch, Hallside	do.	. . . . . 2 0 0
	R. Murdoch, Hallside	do.	. . . . . 1 0 0
<i>Garioch</i>	William Leslie of Warthill	Shorthorn Bull	Silver Medal 0 16 0
	Walter Scott, Glendronach	do.	Class I. L.4 & Med. Sil. Medal 4 10 6
	Silvester Campbell, Kinellar	do.	do. . . . . 3 0 0
	Alex. Robertson, Tocherford	do.	do. . . . . 1 0 0
	Silvester Campbell, Kinellar	do.	Class II. L.3 & Med. Sil. Medal 3 10 6
	Walter Scott, Glendronach	do.	do. . . . . 2 0 0
	Alex. Brown, Knockollochy	do.	do. . . . . 1 0 0
	James Stephen, Conglass	Polled Heifer	L.3 & Med. Sil. Medal 3 10 6
	Robert Maitland, Balhalgardy	do.	. . . . . 2 0 0
	Peter Beattie, Dunnydeer	do.	. . . . . 1 0 0
<i>Lorn and Nether Lorn</i>	J. & J. Macfarlan, Barnacarry	Highland Bull, Class I.	Med. Sil. Medal 0 10 6
	Allan Hall, Ardmaddy	do. Class II.	Med. Sil. Medal 0 10 6
	Dun. McCallum, Glenmackrie	Highland Heifer	Med. Sil. Medal 0 10 6
<i>Argyll</i>	Alex. Holm, Ballimore	Ayrshire Bull, Class II.	Med. Sil. Medal 0 10 6
	James Holm, Castleton	Ayrshire Heifer	Med. Sil. Medal 0 10 6
<i>Valley of Ayr</i>	James Reid, Greystone	Polled Bull, Class I.	Med. Sil. Medal 0 10 6
	William Anderson, Wellhouse	do. Class II.	Med. Sil. Medal 0 10 6
	Wm. A. Mitchell, Auchnagathle	Shorthorn Heifer	Med. Sil. Medal 0 10 6
<i>Spey, Avon, and Fiddichside</i>	William Birnie, Belnagarrow	Shorthorn Bull, Class II.	Med. Sil. Medal 0 10 6
	Wm. M. Skinner, Drumlin	Polled Heifer	Med. Sil. Medal 0 10 6

## HORSES FOR AGRICULTURAL PURPOSES.

<i>Selkirk &amp; Galashiels</i>	Alexander Galbraith, Croy Cunningham	Stallion	25 0 0
<i>Caitness</i>	Peter McRobbie, Sunnyside	Stallion	25 0 0
<i>East. Ross</i>	Peter Crawford, Dumgoyack	Stallion	25 0 0
<i>West. Dist. of Fife</i>	John Galloway, Lochton	Stallion	25 0
<i>Strathendrick</i>	James Gourlay, West Farm	Stallion	25 0 0
<i>Buchan</i>	Alexander Stephen, Invereddie	Brood Mare	L.4 and Med. Sil. Med. 4 10 6
	Alexander Bruce, Millhill	do.	. . . . . 3 0 0
	George Hunter, Brownhill	do.	. . . . . 1 0 0
<i>Kinnaird</i>	R. H. Anderson, Burleigh	Brood Mare	L.4 and Med. Sil. Med. 4 10 6
	James Walls, Blairfordel	do.	. . . . . 3 0 0
	William Flockhart, Flockhouse	do.	. . . . . 1 0 0
<i>Hadington</i>	Adam Smith, Stevenson Mains	Two-year old Colt L.1 10s. & Med. Sil. Med.	2 0 6*
	Marquis of Tweeddale	do.	. . . . . 1 0 0*
	Adam Smith, Stevenson Mains	One-year old Colt L.2 and Med. Sil. Med.	2 10 6
	Earl of Wemyss	do.	. . . . . 1 0 0

Carry forward, L.277 10 0

\* Half Premiums awarded, the number of Lots being under four.

# PREMIUMS AWARDED BY THE SOCIETY IN 1874.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT		
			Brought forward,	L.277	10 0
<i>Haddington</i>	James Darling, Priestlaw	One-year old Colt	.	0	10 0
	Adam Smith, Stevenson Mains	Two-year old Filly L.3 and Med. Sil. Med.	3	10	6
	George Elliot, Abbey Mains	do.	.	2	0 0
	John Sharp, Leaston	do.	.	1	0 0

## SHEEP.

<i>Upper Ward of Leicestershire</i>	W. L. Bruce, Glenkill	Blackfaced Tup , L.3 and Med. Sil. Medal	3	10	6
	James Allan, sen., Clauchlands	do.	.	1	0 0
	Robert Allan, Auchencairn	do.	.	0	10 0
	James Allan, jun., Balnacooile	Blackfaced Shear. Tup L.3 & Med. Sil. Med.	3	10	6
	James Allan, jun., Balnacooile	do.	.	1	0 0
	James Allan, sen., Clauchlands	do.	.	0	10 0
	Robert Crawford, Glenscorrodale	Blackfaced Ewes L.3 and Med. Sil. Med.	3	10	6
	James Allan, sen., Clauchlands	do.	.	1	0 0
	James Allan, jun., Balnacooile	do.	.	0	10 0
	James Allan, jun., Balnacooile	Blackfaced Gimmers L.3 & Med. Sil. Med.	2	10	6
	James Allan, sen., Clauchlands	do.	.	1	0 0
	W. L. Bruce, Glenkill	do.	.	0	10 0
	James Paterson, Carnacoup	Cheviot Tup	.	Silver Medal	0 16 0
	John Paterson, Howcleugh	do.	.	L.3 and Med. Sil. Medal	3 10 6
	John Paterson, Howcleuch	do.	.	.	1 0 0
<i>Lower Ward of Leicestershire</i>	James Denholm, Baitlows	do.	.	.	0 10 0
	John Paterson, Howcleuch	Cheviot Shear. Tup L.3 and Med. Sil. Med.	3	10	6
	James Denholm, Baitlows	do.	.	.	1 0 0
	James Denholm, Baitlows	do.	.	.	0 10 0
	John Paterson, Howcleuch	Cheviot Ewes L.1 10s. and Med Sil. Med.	2	0	6*
	David Tweedie, Castle Crawford	do.	.	.	0 10 0*
	David Tweedie, Castle Crawford	Cheviot Gimmers L.3 and Med. Sil. Med.	3	10	6
	William Hunter, Craighead	do.	.	.	1 0 0
	John Paterson, Howcleuch	do.	.	.	0 10 0
	Colonel Gardyne of Glenforsa	Blackfaced Tup	.	Silver Medal	0 16 0
	Colonel Gardyne of Glenforsa	do.	.	L.3 and Med. Sil. Medal	3 10 6
	William Lang of Glenorm	do.	.	.	1 0 0
	D. Fletcher of Glenaros	do.	.	.	0 10 0
	D. Fletcher of Glenaros	Blackfaced Shear. Tup L.3 & Med. Sil. Med.	3	10	6
	Colonel Gardyne of Glenforsa	do.	.	.	1 0 0
	D. Fletcher of Glenaros	do.	.	.	0 10 0
<i>West Lothian and Eastern District of Stirlingshire</i>	John Thomson, Aros Mains	Blackfaced Ewes L.3 and Med. Sil. Med.	3	10	6
	John Thomson, Aros Mains	do.	.	.	1 0 0
	D. Fletcher of Glenaros	do.	.	.	0 10 0
	D. Fletcher of Glenaros	Blackfaced Gimmers L.3 & Med. Sil. Med.	3	10	6
	John Thomson, Aros Mains	do.	.	.	1 0 0
	William Lang of Glenorm	do.	.	.	0 10 0
	Thomas Livingstone Learmonth	Leicester Tup	.	Silver Medal	0 16 0
	of Parkhall	do.	.	L.3 and Med. Sil. Medal	3 10 6
	James Fleming Carmuir	do.	.	.	1 0 0
	Mrs Peter Reid, Waulkmilton	do.	.	.	0 10 0
	Mrs Peter Reid, Waulkmilton	Leicester Shear. Tup L.3 & Med. Sil. Med.	3	10	6
	John Hill, Carlowie	do.	.	.	1 0 0
	Mrs Peter Reid, Waulkmilton	do.	.	.	0 10 0
	James Fleming, Carmuir	Leicester Ewes L.3 and Med. Sil. Med.	3	10	6
	Mrs Peter Reid, Waulkmilton	do.	.	.	1 0 0
	Mrs Peter Reid, Waulkmilton	do.	.	.	0 10 0
	John Hill, Carlowie	Leicester Gimmers L.3 and Med. Sil. Med.	3	10	6
	James Fleming, Carmuir	do.	.	.	1 0 0
	Mrs Peter Reid, Waulkmilton	do.	.	.	0 10 0

Carry forward, L.364 16

\* Half Premiums awarded, the number of Lots being under four.



NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward, L 364	16 6
<i>Forfar</i>	Earl of Southesk	Leicester Tup	Silver Medal 0 16 0
	Charles Lyall, Old Montrose	do.	L.3 and Med. Sil. Medal 3 10 6
	George Cowe, Balhousie	do.	. . . . . 1 0 0
	George Cowe, Balhousie	Leicester Shear. Tup	L.3. and Med. Sil. Med. 3 10 6
	Charles Lyall, Old Montrose	do.	. . . . . 1 0 0
	George Langlands, Balkemback	do.	. . . . . 0 10 0
	Charles Lyall, Old Montrose	Leicester Ewes L.1, 10s. and Med. Sil. Med.	2 0 6*
	William Goodlet, Bolshan	do.	. . . . . 0 10 0
	Charles Lyall, Old Montrose	Leicester Gimmers L.3 and Med. Sil. Medal	3 10 6
	William Goodlet, Bolshan	do.	. . . . . 1 0 0
	William Goodlet, Bolshan	do.	. . . . . 0 10 0
<i>West</i>	Robert L. Turnbull of Merrylaw	Cheviot Tup	. Silver Medal 0 16 0
<i>Teviotdale</i>	Robert L. Turnbull, Falnash	do.	L.3 and Med. Sil. Medal 3 10 6
	John Moffat, Craik	do.	. . . . . 1 0 0
	John Moffat, Craik	do.	. . . . . 0 10 0
	John Moffat, Craik	Cheviot Shear. Tup	L.3 & Med. Sil. Med. 3 10 6
	John Moffat, Craik	do.	. . . . . 1 0 0
	James Grieve, Branzholmbræs	do.	. . . . . 0 10 0
	John Moffat, Craik	Cheviot Ewes	L.3 and Med. Sil. Medal 3 10 6
	Robert L. Turnbull, Falnash	do.	. . . . . 1 0 0
	James Grieve, Branzholmbræs	do.	. . . . . 0 10 0
	John Moffat, Craik	Cheviot Gimmers	L.3 and Med. Sil. Med. 3 10 6
	Robert L. Turnbull, Falnash	do.	. . . . . 1 0 0
	Robert L. Turnbull, Falnash	do.	. . . . . 0 10 0
<i>Breadalbane</i>	W. G. Stewart Menzies of Culdares	Blackfaced Tup	Silver Medal 0 16 0
	A. & J. McNaughton, Kerrumore	do.	L.3 and Med. Sil. Medal 3 10 6
	John Martin, Claggan	do.	. . . . . 1 0 0
	John Willison, Glenlochry	do.	. . . . . 0 10 0
	John Martin, Claggan	Blackfaced Shear. Tup	L.3 & Med. Sil. Med. 3 10 6
	John Hamilton, Cononish	do.	. . . . . 1 0 0
	A. & J. McNaughton, Kerrumore	do.	. . . . . 0 10 0
	John Willison, Glenlochry	Blackfaced Ewes	L.3 and Med. Sil. Med. 3 10 6
	Alexander McNaughton, Remony	do.	. . . . . 1 0 0
	John Willison, Glenlochry	do.	. . . . . 0 10 0
	John Martin, Claggan	Blackfaced Gimmers	L.3 & Med. Sil. Med. 3 10 6
	A. & F. McNaughton, Chesthill	do.	. . . . . 1 0 0
	John Willison, Glenlochry	do.	. . . . . 0 10 0
<i>Cowal</i>	James Duncan of Benmore	Cheviot Tup	. Silver Medal 0 16 0
	John Crawford, Blairmoie	do.	Med. Silver Medal 0 10 6
	John Turner, Stronechallan	Cheviot Shearling Tup	Med. Silver Medal 0 10 6
	James Turnbull, Dalilongart	Cheviot Ewes	. Med. Silver Medal 0 10 6
	James Turnbull, Dalilongart	Cheviot Gimmers	. Med. Silver Medal 0 10 6
<i>Annandale, including Parish of Kilmichael</i>	James Johnstone of Bodesbeck	Cheviot Tup	. Silver Medal 0 16 0
	James Brydon, Kinnelhead	do.	. Med. Silver Medal 0 10 6
	James Johnstone, Hunterheek	Cheviot Shearling Tup	Med. Silver Medal 0 10 6
	James Brydon, Kinnelhead	Cheviot Gimmers	Med. Silver Medal 0 10 6
<i>Border Union</i>	Thomas Elliot, Hindhope	Border Leicester Tup	Med. Sil. Med. 0 10 6
	J. & T. Clark, Oldhamstocks Mains	Border Leicester Shear. Tup	Med. Sil. Med. 0 10 6
	Thomas Simson, Blainslie	Border Leicester Ewes	Med. Sil. Med. 0 10 6
	George Torrance, Sisterpath	Border Leicester Gimmers	Med. Sil. Med. 0 10 6
<i>Selkirk</i>	John Scott, Deloraine	Cheviot Tup	. Med. Sil. Med. 0 10 6
	John Scott, Deloraine	Cheviot Shearling Tup	Med. Sil. Med. 0 10 6
	Thomas Mitchell, Hutlerburn	Cheviot Ewes	. Med. Sil. Med. 0 10 6
	Thomas Mitchell, Hutlerburn	Cheviot Gimmers	Med. Sil. Med. 0 10 6

L.424 0 6

\* Half Premiums awarded, the number of Lots being under four.

## DAIRY PRODUCE.

<i>Wigtown</i>	Charles Wallace of Dally	Sweet Milk Cheese	Silver Medal	L.0 16
	Mark J. Stewart, Ardwell	do.	L.2 and Med. Sil. Med.	2 10
	Andrew Lockhart, Gariochtrie	do.	.	1 0
	James Spens, Low Ardwell	do.	.	0 10
	John Neill, Blair	Cured Butter	L.1 and Med. Sil. Med	1 10
	Alexander Forsyth, Valleyfield	do.	.	0 10
	James Spens, Low Ardwell	do.	.	0 5

## SPECIAL GRANTS.

<i>Edinburgh</i>	} Vote in aid of Premiums, . . . .	. 50 0 0
<i>Christmas Club</i>		
<i>Ayrshire</i>	Vote to Dairy Produce Show at Kilmarnock .	. 20 0 0
		<hr/> L.70 0 0

## MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

## ABERDEENSHIRE.

NAME OF SOCIETY.	MEDAL AWARDED TO	FOR
<i>Auchindoir, Kil- drumma, and Towie</i>	Peter Cran, Old Morlich	Polled Bull
	H. G. Lumsden, Clova	Polled Cow
	John Wattie, Milltown	Shorthorn Bull
	George Cruickshank, Drumnahive	Shorthorn Cow
<i>Buchan</i>	George Smith, Main. of Gaval	Shorthorn Cow
	George Greig, Middlethirld	Polled Cow
<i>Cluny</i>	John M'Hardy, Enzean	Shorthorn Bull
	John Gordon of Cluny	Shorthorn Heifer
	Daniel MacAllan, Meikle Midmar	Farm Management
	Peter Kerr, Balvack	Green Crop
<i>Cromar, Upper Dee and Donside</i>	George Reid, Smiddyhill	Polled Bull
	Marquis of Huntly	Polled Cow
	James M'Combie, Daugh	Shorthorn Bull
	John Begg, Lochnagar	Shorthorn Cow
<i>Donside Ebriesside</i>	James White, Clinterty	Green Crop
	John Walker, Auchnaveird	Polled Bull
	Harry Milne, Meikle Ardo	Draught Mare
	Robert Kilgour, Ardlind	Leicester Shearling Tup
<i>Formartine</i>	Mrs Finny, Brownhill	Spanish Poultry
	William S. Marr, Upper Mill	Shorthorn Bull
	Amos Cruickshank, Sittyton	Shorthorn Heifer
	John Beaton, Lethenty	Shorthorn Bull
<i>Fyvie</i>	George Roberts, Fetterletter	Shorthorn Cow
	William Philip, Lofthillock	Swedish Turnips
<i>Garioch Turnip Society</i>	John Maitland, East Balhalgardy	Green-topped Yellow Turnips
	Mrs Maitland, Netherlon	Poultry
<i>Insch Horticultural Society</i>	Mrs M'Cracken, Emerald Bank	Cured Butter
	James Rae, Cluny	Dorking Cock and Hen
<i>Keig</i>	Mrs Smith, Mucklehaugh	Fresh Butter
	Mrs Adams, Inchley	Dorkings
	George Fraser, Greenburn	Bramahs
	Mrs G. Philip, Crofts	Spanish
<i>Kinncardine-O'Neil and Upper Deeside</i>	D. Anderson, Craigmyle	Cross Chickens
	Mrs Francis Davie, Mid-Beltie	Sweet Milk Cheese
	Mrs Francis Davie, Mid-Beltie	Cured Butter
	Miss Barbara Coupland, Mill of Campfield	Oatmeal Cakes
	James Moir, Mains of Wardhouse	Shorthorn Bull
	James Moir, Mains of Wardhouse	Shorthorn Heifer
	Peter Beattie, Dunnydeer	Polled Cow
	Col. A. S. Leith Hay, Leithhall	Cross Cow
<i>Kinnethmont</i>	Peter Beattie, Dunnydeer	Draught Mare

\* Half Premiums awarded, the number of Lots being under eight.

# PREMIUMS AWARDED BY THE SOCIETY IN 1874.

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NAME OF SOCIETY.	MEDAL AWARDED TO	FOR
<i>Leochel-Cushnie</i>	James Strachan, Wester Fowls	Polled Bull
	Hary Shaw, Bogfern	Polled Cow
<i>Mar</i>	Silvester Campbell, Kinellar	Shorthorn Bull
	Silvester Campbell, Kinellar	Shorthorn Heifer
	William M'Combie of Easter Skene	Polled Cow
	William Littlejohn, Whitemyres	Draught Mare
<i>North-East</i>	James Innes, Mains of Pittulie	Seeds
<i>Aberdeenshire</i>	John Bell, Merryhillock	Roots
	James Burnett, Kirkton	Draught Filly
	James Cruickshank, Ladysford	Shorthorn Bull
	Charles A. Barclay, Aberdour House	Polled Cow
	William Watson, Skelmana	Dairy Produce
<i>North of Scotland</i>		
<i>Root, Vegetable,</i>	John Annand, Upperboat	Turnips
<i>and Fruit Association</i>	David Littlejohn, Shiels	Potatoes
<i>Strathboyie</i>	Dr James Milne, Cairnhill	Oats
	Mrs Gordon, Cauldrain	Collection of Roots
<i>Strichen</i>	Alex. Biddie, Newlandhill	Polled Bull
	George Greig, Middlethind	Polled Cow
<i>Turriff</i>	Theodore Henderson, Camaloun	Draught Mare
	John Morrison, Auchlunn	Pair of Geldings
	Mrs Johnston, Nether Darley	Cured Butter
	Mrs Alexander, South Balnoon	Sweet Milk Cheese
	Alex. Bow, Newton	Turnips
	Colonel F. G. Campbell of Troup	Oats
	William Leslie of Wraithill	Green Crop (Heavy Land)
	Alex. Auld, Newton Rothmalse	Green Crop (Light Land)

## ARGYLLSHIRE.

<i>Kilfinan</i>	C. Macpherson Campbell of Baltimore	Highland Bull
	Neil Nicolson, Carra	Ayrshire Cow
	Robert Scott, Craignafeich	Wool
<i>Kintyre</i>	Neil Macnaughton, Currine	Ayrshire Cow
	John Craig, Drumlemble	Clydesdale Mare
	J. N. Fleming of Keil	Blackfaced Tup
	Alex. Cordiner, Machrimore	Sweet Milk Cheese

## AYRSHIRE.

	Andrew Allan, Munnoch	Cheese
	James Brown, Ardneil	Cured Butter
	Robert Young, Yonderton	Ayrshire Bull
	William Caldwell, Boydstone	Ayrshire Cow
	John Rankine of Beoch	Ayrshire Bull
	J. N. Fleming of Knockdon	Ayrshire Cow
	Crawford M'Cracken, Moorston	Brood Mare
	Thomas Crawford, Drumbeg	Gelding
	John Anderson, Shankston	Blackfaced Gimmers
	John Gray, Midton of Auchendrane	Cheese
<i>Coylton and Stair</i>	John M'Cartney, Wraithill	Ayrshire Cow
	Hugh Douglas, Carston	Draught Gelding
<i>Craigie</i>	James Kilpatrick, Craigie Mains	Ayrshire Bull
	William Brown, Lodgebush	Ayrshire Cow
	James Picken, Leigh Langside	Clydesdale Mare
<i>Cunnock</i>	R. & P. Wardrope, Garlaff	Ayrshire Bull
	Wm. Guthrie, Cunnock	Ayrshire Cow
	John Baird, Garclaugh	Sweet Milk Cheese
	Mrs M'Lanachan, Loganhill	Cured Butter
	James Murray, Donaldson Bracs	Collection of Seeds
	John Wallace, Treeshill	Collection of Roots
<i>Dalry</i>	Robert Witherspoon, Kersland	Ayrshire Bull
	Hugh Archibald, Auldmuir	Ayrshire Cow
<i>Dundonald</i>	Hon. G. R. Vernon, Auchans	Ayrshire Bull
	Hon. G. R. Vernon, Anchans	Ayrshire Cow
<i>Gulston</i>	Thomas Donald, Crosstree	Ayrshire Bull
	And. Young, Bruntwoodhill	Ayrshire Cow

NAME OF SOCIETY.	MEDAL AWARDED TO	FOR
<i>Kilmarnock</i>	Duke of Buccleuch, K.G., Drumlanrig William Duncan, Brockwellmuir James Meikle, Lugtonridge George Knox, Polnoon Win Pearson, Crossburn Jane Paik, Knockinlaw	Ayrshire Bull Ayrshire Cow Clydesdale Stallion Clydesdale Mare Farm Service Farm Service
<i>Kirkmichael</i>	John Rankine of Beoch William Niven, Laigh Cullean William Anderson, Barneil Quintin Kerr, Downicston	Ayrshire Bull Ayrshire Cow Ayrshire Heifer Clydesdale Mare
<i>Loudoun</i>	George Alston, Loudounhill John Nisbett, Longgreen	Ayrshire Bull Ayrshire Cow
<i>Mauchline</i>	Mrs John Stevenson, Boghead Mrs John Stevenson, Boghead	Sweet Milk Cheese Dairy Management
<i>Muirkirk</i>	Thomas Armour, Stairahd R. & P. Wardrope, Garlaff Ivie Campbell, Craigman John Vallance, Smallburn James Craig, Polquheys James Findlay, Mansefield Gavin Moffat, Buinfoot	Collection of Roots Ayrshire Bull Ayrshire Cow Clydesdale Mare Blackfaced Tup Sweet Milk Cheese Collection of Roots
<i>Near Cumnock</i>	R. & P. Wardrope, Garlaff Ivie Campbell, Craigman John Steel, Fardennoch James Craig, Polquheys	Ayrshire Bull Ayrshire Cow Clydesdale Mare Blackfaced Tup
<i>Sorn</i>	James & John Baird, Blindburn John & Andrew M'Crae, Holehouse William Weir, Westtown Matthew Young, High Brocklar John Watson, Daldorch	Ayrshire Bull Ayrshire Cow Sweet Milk Cheese Cured Butter Fences
<i>Stewarton</i>	Andrew Brown, Horsemuir J. & R. Stevenson, Auchentiber John Campbell, Overlochridge	Ayrshire Bull Ayrshire Cow Sweet Milk Cheese
<i>Symington</i>	James Walker, Cankerton James Torrance, Jeanfield Alexr. Paton, Stonecalsey	Collection of Roots Ayrshire Bull Ayrshire Cow
<i>Tarbolton</i>	Hunter Drennan, Langlands	Collection of Roots
<i>West Kilbride</i>	Robert Young, Yonderton Wm. Muir, Pantonvair George Harvey, Gill James Brown, Ardnief David Cunningham, Chapelton	Ayrshire Bull Ayrshire Cow Sweet Milk Cheese Cured Butter Collection of Roots

## BANFFSHIRE.

<i>Central Banffshire</i>	Wm. Longmore, Bogbain John Barclay, Braes James Gordon, Tarwathie Mrs Stephen, Milltown	Draught Mare Oats Barley Cured Butter
<i>United Banffshire</i>	Colonel F. G. Campbell of Troup Colonel F. G. Campbell of Troup James Merson, Craigwillie James Merson, Craigwillie	Chevalier Barley Sandy Oats English Berlie Oats Potato Oats

## BUCE.

Robert MacAlister, Mid Ascog James Brown, Ballochgoy Robert Macfie, Nether Ettrick	Ayrshire Cow Leicester Tup Green Clop
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## CAITHNESS-SHIRE.

<i>Caithness</i>	James M'Beath, Gerston James M'Kidd, Thurso East W. & J. Forsyth, Biornach James Purves, Barrogill William Bain, Isauld	Shorthorn Bull Shorthorn Cow Ox Bere Oats
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CLACKMANNANSHIRE.

NAME OF SOCIETY.	MEDAL AWARDED TO	
<i>Clackmannanshire</i>	John Menzies, Inch John Menzies, Inch Alex. Macnab, Glenochil Donald Fisher, Gartenkeir	Green Crop (Carse) Green Crop (Dryfield) Hay Crop (Carse) Hay Crop (Dryfield)

DUMBAERTONSHIRE

<i>Dumbartonshire</i>	Andrew Howie, Middleton David Riddell, Kilbowie Peter Lennox, Kirkton James Calder, Colgrain	Ayrshire Bull Ayrshire Cow Leicester Tup Leicester Ewe
<i>Western District of Dumbarton</i>	Sir James Colquhoun of Luss, Bart Sir James Colquhoun of Luss, Bart.	Ayrshire Bull Ayrshire Cow

DUMFRIESSHIRE.

<i>Nithsdale</i>	William Borland, Townfoot Charles M'Kie, Smithtown	Sweet Milk Cheese Cured Butter
<i>Sanguhar</i>	Duke of Buccleuch, K.G. Abram Kerr, Castlehill Abram Kerr, Castlehill Samuel Irving, Carco James Moffat, Gateside	Ayrshire Bull Ayrshire Cow Draught Mare Cheviot Tup Blackfaced Tup

EDINBURGSHIRE.

<i>Dalketh</i>	James Lawrie, Mitchelston Duke of Buccleuch, K.G. Duke of Buccleuch, K.G. Robert Dundas of Arniston John Gibson, Woolmet James Wilson, Wester Cowden Thomas Proudfoot, Pinkiehill	Draught Mare Leicester Tup Boar Sow Dorkings Early Angus Oats Chevalier Barley
<i>Western District of Mid-Lothian</i>	John Meikle, Seafeld A. & J. Clarkson, Leyden	Ayrshire Bull Draught Mare

ELGINSHIRE.

<i>Forres and Northern Club</i>	R. H. Harris, Earnhill George Grant, Pollo Sir William Gordon Cumming of Altyre, Bart. John Cran, Keith R. H. Harris, Earnhill	Ox Heifer Sheep Pig Collection of Roots Collection of Seeds
<i>Morayshire</i>	James Smith, Middlefield James Smith, Middlefield William Brown, Linkwood James M'William, Stonyton Charles Stuart, Tomindugle Robert Skene, Milton of Pluscarden James M'Kenzie, Orton	Wheat Barley Oats Grass Seeds Turnips Potatoes
<i>Spur, Aron, and Fuldochside</i>	James Macpherson, Blacksboat Sir Geo. Macpherson Grant of Ballindalloch, Bart. Sir Geo. Macpherson Grant of Ballindalloch, Bart. Charles Stuart, Tomindugle	Common Barley Early Angus Oats Sandy Oats Rye Grass Seeds

FIFESHIRE.

<i>Auchtermuchty</i>	James Blyth, Leckiebank James Tod, Easter Cash A. H. Tyndall Bruce of Falkland J. Bogie, Balcanquhal	Shorthorn Bull Draught Mare Leicester Tup Green Crop
<i>Dunnikier</i>	James T. Oswald of Dunnikier Captain Wyllie, Mitchelston	Shorthorn Bull Brood Mare
<i>Kinglassie</i>	David Beath, Auchmuir George Gibb, Pitteuchar	Shorthorn Bull Clydesdale Mare

INVERNESS-SHIRE.

<i>Badenoch and Rothiemurchus</i>	John M'Gillivray, Ballachroan Roderick MacGregor, Kincaira	Highland Bull Blackfaced Gimmers
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NAME OF SOCIETY	MEDAL AWARDED TO	
<i>Glen Uryhart</i>	Major W. Grant, Drumbuie Mrs Campbell, Drumcoie Mrs Fraser, Balbeg	Oats Cured Butter Sweet Milk Cheese Chevalier Barley Sandy Oats Perennial Rye Grass Turnip Crop
<i>Inverness</i>	James Cumming, Alanfearn James Paterson, Knocknagael Donald Paterson, Balrobert Evan Baillie of Dochfour	Ox Heifer Sheep Berkshire Pig Poultry Roots Polled Bull Highland Heifer Common Barley Sandy Oats Ryegrass Collection of Roots Farm Management Green Crop
<i>Northern Counties</i> <i>Pat Show</i>	James Bruce, Burnside George Grant, Pollo Sir Wm. G. Gordon Cumming, of Altyre, Bart. Lord Lovat, K.T., Beaufort Castle Mrs Ferguson, Primrose Villa, Inverness Jonathan Middleton, Fearn	
<i>Sutherland</i>	Charles Grant, Advie John Grant, Inverlaidnau Captam Robert Grant, Benanach Charles Grant, Advie Donald M'Dougall, Craggan Alexander Mann, Ballintomb Donald Grant, Mullochard Donald Grant, Mullochard	
KINCARDINESHIRE.		
<i>Fettercairn</i>	Sir Thomas Gladstone of Fasque, Bart. John Duie, Gassesslie William Kinnear, Bridgemill James C. Thom, Quithelhead	Polled Bull Brood Mare Green Crop Green Crop
<i>Kincardineshire</i> <i>Strachan</i>	Mrs Wilson, Gateside John Shepherd, Haugh	Poultry Collection of Roots
KINROSS-SHIRE.		
<i>Kinross-shire</i>	Robert Hart Anderson, Burleigh Mrs Tod of East Brackly	Clydesdale Mare Clydesdale Colt
LANARKSHIRE.		
<i>Arondale</i>	Alexander Vallance, Greathill William Hamilton, Newhouses	Ayrshire Bull Ayrshire Cow
<i>Biggar</i>	William Muir, Easterside John A. White, Shields mains George Tweedie, Lamington	Ayrshire Cow Draught Mare Leicester Tup
<i>Bothwell</i>	John Dick, Shirrel	Ayrshire Bull
<i>Cadiler</i>	Alexander Fleming, Raith Mrs Gilchrist, Park	Ayrshire Cow Ayrshire Bull
<i>Culder Waterhead</i>	Robert M'Kean, Lumloch James Logan, Eastshield	Clydesdale Mare Ayrshire Bull
<i>Carmunnock</i>	Alexander Brackenridge, Stevenston Mains William Young, Waterbank Mrs Fleming, Muirside	Entire Colt Ayrshire Bull Ayrshire Cow
<i>Lanarkshire</i>	Lawrence Drew, Merryton William Muirhead, Auchensairn	Ayrshire Cow Clydesdale Stallion
<i>Upper Ward of</i> <i>Lanarkshire</i>	Robert Cadzow, Thornyhills John Hamilton, North Cumberhead	Ayrshire Cow Blackfaced Tup
LINLITHGOWSHIRE.		
<i>Whitburn</i>	John Meikle, Seafield John Meikle, Seafield	Ayrshire Bull Ayrshire Cow
NAIRNSHIRE.		
<i>Nairnshire</i>	William A. Fraser, Brackla James Lawrence, Thornhill James Lawrence, Thornhill James Stephen, Meikle Geddes William A. Fraser, Brackla Alexander Walker, Brightmony John M'Lennan, Drumornie John M'Lennan, Cairnglass	Shorthorn Bull Shorthorn Cow Draught Mare White Wheat Chevalier Barley Longfellow Oats Ryegrass Seeds Roots

## PEEBLES SHIRE.

NAME OF SOCIETY.	MEDAL AWARDED TO	FOR
<i>Broughton</i>	Mrs Fowler, Wme	Cured Butter
<i>West Linton</i>	William A. Woddrop, Garvald House	Sweet Milk Cheese
	John Liddell, Roseview	Powdered Butter

## PERTHSHIRE.

<i>Culross</i>	William Beveridge, East Grange	Farm Management
	James Thomson, Middle Grange	Hay
	Christopher Forrester, Balgownie	Turnips
<i>Dunblane</i>	Peter McCaull, Dykedale	Shorthorn Bull
<i>Dunning</i>	Miss Jane White, Baadhead	Cured Butter
<i>Middle District of Athol and Tullymet</i>	Robert Conacher, Kincairgie	Green Crop
<i>Moulin</i>	William Stewart, Easter Achlat	Green Crop
<i>Scottish Midland</i>	William Dingwall, Ramornie	Cross-Bred Heifer
	James Blyth, Leckiebank	Dairy Cow
	Thomas Ferguson, Kinnochtry	Leicester Tup
<i>Strathearn (Central)</i>	James Mackie, Invermay	Draught Mare
	Messrs M'Glashan, Clevage	Leicester Tup
	David Dow, Bahmano	Common Barley
<i>Strathearn (Upper)</i>	Charles Home Drummond Moray of Abercairny	Shorthorn Bull
	Robert Gardiner, Chapelbank	Draught Mare
	Donald M'Intyre, Tighnablair	Blackfaced Tup

## RENFREWSHIRE.

<i>Lower Ward of Renfrewshire</i>	Sir M. R. Shaw Stewart of Ardgowan, Bart.	Ayrshire Bull
	Mrs Douglas, Green	Ayrshire Cow
	John Simpson, Tourgill	Blackfaced Tup
<i>Meurms</i>	Mrs Rodger, Crook	Ayrshire Bull
	Andrew Gilmour, Townhead	Ayrshire Cow

## ROSS-SHIRE.

<i>Easter Ross</i>	George Grant, Pollo	White Wheat
	Alexander M. Clarke, Meddat	Chevalier Barley
	John Robertson of Rhynie	Potato Oats
	John Douglas, Calrossie	Perennial Rye Grass
<i>Wester Ross</i>	David Fenton, Kinkell	Barley
	Henry Sim, Ardullie	Oats
	Murdo Bethune, Muirton	Ryegrass

## STIRLINGSHIRE.

<i>Eastern District of Stirlingshire</i>	William Weir, Inches	Ayrshire Bull
<i>Gargunnoch</i>	T. S. Puterson, Thornton	Shorthorn Cow
	Alexander Buchanan, Whitehouse	Shorthorn Bull
	John Lang, Bield	Ayrshire Cow
<i>Stirlingshire</i>	Thomas A. Carrick, Easter Cambusdrenny	Seed Wheat
	David Dewar, Shaw	Barley
	Peter Dewar, King's Park	Oats
	David Dewar, Shaw	Vetches

## WIGTOWNSHIRE.

<i>Kirkmaiden</i>	Matthew Kerr, Killunpha	Green Crop
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## PLOWING COMPETITIONS.

In 1873-74 the Society's Silver Medal was awarded at 187 Ploughing Competitions, as follows:—

## ABERDEENSHIRE.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
1.	Aboyne.	Aboyne.	James Esson, Mill of Dess.
2.	Ballater.	Braehead of Tullich.	Charles Forbes, Balloch.
3.	Belhelvie.	Middle Ardo.	David Forrest, Balmedie.
4.	Buchan (Deer District).	Dens of Criche.	James Burnett, Stichen Mains.
5.	Buchan (Fraserburgh Dist.)	Nether Cortes.	William Laurance, Blackhills.
6.	Clatt, Kinnethmont, &c.	Towie.	William Horn, Dykenook.
7.	Coldstone and Migvie.	Pittelachie.	Peter Glennie, Bielack.
8.	Countesswells.	South Lasts.	James Watt, North Lasts.
9.	Crathie.	Balnallan.	Charles Stables, Abergeldie.
10.	Ebriesside.	Mains of Auchnagatt.	George Forbes, Crowniehilllock.
11.	Fintray.	Mill of Fintray.	Peter Cowie, Newlands.
12.	Fyvie.	Burnside.	Alexander Genie, Upperhall.
13.	Mar.	Caskieben Main.	William Thomson, Woggle.
14.	North-East Aberdeenshire.	Memsie.	Alexander Will, Bridgefoot.
15.	Pettersculter and Drumoak.	North Lasts.	Charles Carnie, Upper Anguston.
16.	Strathbogie.	Westerton.	Charles Milne, Carse of Kinnoir.
17.	Strichen.	Redbog.	Alexander Rollo, Borrohill.

## ARGYLLSHIRE.

18.	Glenorchy.	Corryghoil.	David Brown, Edendonich.
19.	Kilfinan.	Achoyle.	Peter White, Ardmanock.
20.	Killean and Kilcalmonell.	Killean.	James McNeill, Auchinafaud.
21.	Kintyre.	Dalreoch.	Alexander Ronald, Pennysearach.
22.	Lorn.	Dunach.	John Cowan, Gylen.
23.	Poltalloch.	Killinnochonach.	Archibald Campbell, Killinnochonoch.
24.	Skipness.	Skipness.	John Campbell, Skipness.

## AYRSHIRE.

25.	Ardrossan.	Stevenston.	David Mc'Dowal, Chapelhill.
26.	Ayr and Alloway.	Laigh Corton.	James Aird, Doonholm.
27.	Carrick.	Genoch.	Hugh Harvey, Jameston.
28.	Coylton.	Barclaugh.	Samuel Hay, Bridgend.
29.	Dalry.	Ryesholm.	Daniel Lamont, Cockenzie.
30.	Dalrymple.	Holms.	James McKie, Burnell.
31.	Fenwick.	High Todhill.	Mathew Wallace, Raithill.
32.	Galston.	Old Walls.	Robert Fleming, Bullhill.
33.	Kirkoswald.	Kirklands.	William Ramsay, Birnyhill.
34.	Monkton and Prestwick.	Howland.	James Craig, Whiteside.
35.	New Cumnock.	Rottenyard.	William Millar, Whitehill.
36.	Ochiltree.	Watson.	James Murdoch, Laigh Taubeg.
37.	Sorn and Dalgain.	Westtown.	Charles Baird, North Blairkipp.
38.	Straiton.	Longcroft.	Thomas Lennox, Goosehill.
39.	Stewarton.	Castleton.	Robert Stillie, Kirkmuir.
40.	Tarbolton.	Langlands.	Robert Neill, West Doura.

## BANFFSHIRE.

41.	Grange.	Berryleys.	James Murray, Westerton.
42.	Keith.	Montgrew.	Adam Christie, New Mill of Keith.
43.	Marnoch.	Janefield.	Robert Redford, Knockorth.
44.	Strathavon.	St Bridget.	Alexander Watson, Inverlochty.

## BERWICKSHIRE.

45.	Cockburnspath.	Linhead.	Robert Dewar, Hill.
46.	Coldstream.	Ramrig.	William Cleghorn, Simprin Mains.
47.	Eccles.	Eccles.	Thomas Slater, Eccles Toft.
48.	Lammermoor.	Godscroft.	James Renton, Godscroft.
49.	Lauderdale.	Newmills.	Andrew Tofts, Hindsie Hill.
50.	Westruther.	Bassendeanhill.	Robert Hill, Dods.



## BUTE AND ARRAN.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
51.	Arran.	Clachaig.	Colin McGregor, Shedog.
52.	Bute.	Auchenteerie.	Alex. Montgomerie, Auchenteerie.

## CAITHNESS-SHIRE.

53.	Caithness.	Standstill.	John Brims, Whitefield.
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## CLACKMANNANSHIRE.

54.	Hillfoots.	Aitkenhead.	William Tairney, Broadcarse.
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## DUMBARTONSHIRE.

55.	Cumbernauld.	Condorat.	Alex. Allan, Westwood.
56.	East Kilpatrick.	Templefarm.	William Renwick, Castle.
57.	Kilmaronock and Bonhill.	Mains.	John Bilsland, Mains.
58.	Kirkintilloch.	Wallfist.	William Duncan, Auchendavie.

## DUMFRIESSHIRE.

59.	Glencairn.	Castlehill.	Thomas Coulthart, Stewarton.
60.	Keir.	New Mains.	Joseph Kirkpatrick, Boatcroft.
61.	Kirkconnel.	Eastside.	William Gibson, Burnfoot.
62.	Lochmaben.	West Croft.	Andrew Tweedie, Redhall.
63.	Mid-Nithsdale.	Floors.	William Campbell, New Cample.
64.	Tinwald.	Hazlerigg.	James Hiddelston, Hazlerigg.

## EDINBURGHSHIRE.

65.	Currie.	Baberton Mains.	David Hook, Shothed.
66.	Glencorse Mains.	Glencorse Mains.	Thomas Peden, Glencorse Mains.
67.	Lasswade.	Moat.	John Hunter, Wester Melville.
68.	Liberton.	Broomhills.	Alex. Pennycook, Fullford.
69.	Mid-Lothian.	Cockpen.	Thomas Greig, Parduvine.
70.	Penicuik.	Lawhead.	George Denholm, Halls.
71.	Temple.	Esperston.	William Burns, Moorfoot.
72.	West Calder.	Polbeth.	Thomas Graham, Rosebank.

## ELGINSHIRE.

73.	Central Morayshire.	Eastgrange.	Finlay Campbell, Househill.
74.	Elgin (Western District).	Manbeen.	Walter Grant, Scotstonhill.
75.	Rafford.	Brockloch.	Alex. McArthur, Mains of Burgie.
76.	Rothies and Speymouth.	Dundurcas.	William McDonald, Glen of Rothies.
77.	Spey, Avon, &c.	Ballindalloch.	John Smith, Drumin.
78.	Strathspey.	Dallachapple.	John Smith, Pollockwick.
79.	Urquhart.	Broomhill.	Alex. French, Corskie.

## FIFESHIRE.

80.	Auchtermuchty.	Falkland House Farm.	John Kirk, Wellfield.
81.	Crossgates.	Vantage Fordel.	James Nellie, Blacklaw.
82.	Dunnikier.	Wester Balbeggie.	Andrew Wright, Dunnikier.
83.	Howe of Fife.	Rankeillour.	Alex. Hay, Newhall.
84.	Largo.	Cairn.	James Wilson, Cairn.
85.	Leslie.	Inglie.	David Leighton, Farmlands.
86.	North of Fife.	Balhelvie.	James Kinnear, Luthrie Bank.

## FORFARSHIRE.

87.	Mains of Strathmartine.	Middle Cragie.	John Wilson, Mill of Mains.
88.	Tannadice and Outhlaw.	Baldonkie.	David Whytock, Glen Ogil.

## HADDINGTONSHIRE.

89.	Humble and Fala.	Fala Mains.	David Whitson, Blackshiels.
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# PREMIUMS AWARDED BY THE SOCIETY IN 1874.

## INVERNESS-SHIRE.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
90.	Abernethy.	Abernethy Manse.	Donald M'Intosh, Croftonnan.
91.	Badenoch.	Nuide.	John Kennedy, Pitmain.
92.	Duthill.	Inverdaidnan.	Alex. M'Intosh, Mullochard.
93.	Inverness.	Oldtown of Culduthel.	John M'Kenzie, Kerrowaird.
94.	Inverness.	Polmaillie.	Simon Fraser, Drumnadrochit.
95.	Strathdearn.	Clurie.	Alex. Gordon, Dalmigavie Mains.
96.	Strathnairn.	Daviot.	Angus Robb, Viewhill.

## KINCARDINESHIRE.

97.	Durris.	Bankhead.	John Petrie, Quithillhead.
98.	Netherley.	Mains of Netherley.	George Milne, Craigwells.
99.	Nigg.	Altens.	James Forrest, Kincorth.
100.	Portlethen.	Bourtreebush.	William Masson, Balquharn.
101.	Rickarton and Urie.	Cowton.	William Moir, Backburn.
102.	Strachan.	Tillygowrie.	Robert Shepherd, Haugh.

## STEWARTRY OF KIRKCUDBRIGHT.

103.	Crossmichael.	Hillowton.	David Bell, Chapmanton.
104.	Glenkens.	Dalarran.	William Stewart, Burnfoot.
105.	Kirkpatrick Durham.	Boghall.	James Nivison, Lairdlaugh.
106.	Kirkcudbright.	Lowbanks.	William Haugh, Bombie.
107.	New Abbey.	Overton.	David Young, Gibbonhill.
108.	Rerrick.	Rascarrel.	Samuel Caldwell, Netherlaw.

## LANARKSHIRE.

109.	Abington.	Stonnyburn.	George Lindsay, Nether Abington.
110.	Cadder.	Bearyards.	James Cameron, Buchlay.
111.	Calderwaterhead.	Easterhouse.	Thomas Waddell, Southrigg.
112.	Carmunnock.	Mid Netherton.	Alex. Crawford, Meikle Driggs.
113.	Carstairs.	Cowford.	Thomas Scott, Netherton.
114.	East Kilbride.	Netherton.	James Borland, Duncanrigg.
115.	Hamilton.	Browntod.	Stewart Smith, Neilsland.
116.	New Monkland.	Rochshalloch.	William Mur, Moss-side.
117.	Old Monkland.	Coatbridge.	David Walker, Gartvain.
118.	Wiston and Robertson.	Little Galla.	John Stoddart, Newton of Weston.

## LINLITHGOWSHIRE.

119.	Blackburn.	Seafeld.	John Cruickshanks, Standhill.
120.	Kinneil.	Nether Kinneil.	John Robertson, Lochhouse.
121.	West Lothian.	Bridgend.	Alex. Gray, Threemiletown.

## NAIRNSHIRE.

122.	Ardclach.	Mains of Glenferness.	Alex. Mackay, Fleenasmore.
123.	Nairnshire.	Lochloy.	Alex. Kinnaird, Ballyknockan.

## ORKNEY.

124.	Burray.	N. Field.	John Wards, Burray Mains.
125.	Rousay.	Westness.	John Harold, Sangskael.
126.	Shapinsay.	Strathoid.	John Slater, Balfour Mains.
127.	South Ronaldshay.	Smiddy Banks.	Alex. Thomson, Berriedale.
128.	Tankerness.	Hall of Tankerness.	James Bremner, Campston.
129.	Unst.	Springfield.	John M'Gregor, Hillside.
130.	West Mainland.	How.	David Stanger, Garson.

## PEEBLESHIRE.

131.	Eddleston.	Windylaws.	James Fleming, Darnhall.
132.	Macbiehill.	Macbiehill.	John Hutchison, Garvald.
133.	Manor.	Milton.	James Robertson, Haswellsyke.
134.	Newland.	Wester Deans.	William Rankin, Easter Dean.
135.	West Linton.	Linton Cottage.	James Pennycook, Garvald.

## PERTHSHIRE.

NO.	NAME OF SOCIETY.	PLACE OF COMPETITION.	SILVER MEDAL AWARDED TO
136.	Ardoch.	Whitestown.	Andrew Kettles, Townhead.
137.	Arnprior.	South Flanders.	William M'Gibbon, Faraway.
138.	Auchterarder and Blackford.	Newbiggings.	Charles King, Newbiggings.
139.	Blair-Drummond, &c.	Cambus-Drennie.	Walter Hallum, Rossburn Lane.
140.	Breadalbane (Eastern Dist.).	Mains of Murthly.	Duncan M'Laren, Comrie Farm.
141.	Breadalbane (Western Dist.)	Dall.	Donald Campbell, Craggan.
142.	Callander.	Auchenlaich.	Alex. Mackinnon, Brackland.
143.	Comrie and Upper Strathearn	Strowan.	William M'Kenzie, Balnmuick.
144.	Culross.	Balgownie Mains	George Spittal, Culross.
145.	Drummond Castle.	Muirside.	Thomas Marshall, Templemill.
146.	Foss and Straththummel.	Kynachan.	Alex. Stewart, Foss.
147.	Glenalmond	Aldie.	Daniel Anderson, East Buchanty.
148.	Glenlyon.	Roro More.	Duncan M'Nab, Moar.
149.	Kilmadock.	Row.	Archibald M'Laren, Glenquhilk.
150.	Madderty.	Newraw.	William Dewar, Ardbennie.
151.	Methven.	Busby.	Donald Patton, Cargates.
152.	Mid D. of Athole and Tullymet	Guay.	Thomas M'Donald, Haugh of Kilmorich.
153.	Monzievaird and Strwan.	Locherlour.	Alex. Jack, Brainercroft.
154.	Moulin.	Mains of Ballyonkan.	William Brown, Auchlat.
155.	Port of Monteith.	Castle Farm.	William Blair, Hiron of Cardross.
156.	Rannoch.	Craigannour.	Alex. M'Dougall, Innerhadden.
157.	St Martins	Bandirran.	James Shidders, Middleton.
158.	Strathbraan.	Tomnagairn.	Alex. Campbell, Balchraggan.
159.	Strathearn (Central).	Cairnie.	Daniel Douglas, Calfwad.
160.	Strathord.	Little Tulliebelton.	James Malcolm, Farkhill.
161.	Struan, &c.	Calvine.	John Campbell, Calvine.
162.	Thornhill	Myme.	James Patterson, Stack O'Broom.
163.	Trinity Gask.	Lowbank.	Charles Barclay, West Mill of Gask.
164.	Weem	Weem Hotel Farm.	Duncan Leslie, Balhomas.

## RENFREWSHIRE.

165.	Cathcart and Eastwood.	Cathcart.	Robert Watson, Sheep Park.
166.	Eaglesham.	Highcraig.	James Crawford, Nether Craig.
167.	Erskine.	Glenshinnoch	John Park, Glenshinnoch.
168.	Greenock* Gourock, &c.	Larchfield.	Thomas Crawford, Kilbride.
169.	Kilbarchan.	Milliken.	James Lang, Blackstone.
170.	Inchinnan.	Town of Inchinnan.	Alex. Shearer, Blythswood.
171.	Kilmalcolm and Port-Glasgow.	Carsemeadow.	James Crawford, East Kilbride.

## ROSS-SHIRE.

172.	Black Isle.	Tullieh.	William Ross, Manse of Knockbain.
173.	Easter Ross	Ballintain.	Hector Mitchell, Boobain.
174.	Ferrintosh.	Kinkell.	Murdo M'Rae, Canon Bae.
175.	Lewes.	Melbost.	William Naughton, Holm.
176.	Wester Ross.	Dochearty.	Alex. M'Donald, Coul.

## ROXBURGHSHIRE.

177.	Border Union.	Rutherford.	Thomas Thomson, Stobswoodfort.
178.	Lilliesleaf.	Hermiston.	Charles White, Spital.

## STIRLINGSHIRE.

179.	Bannockburn, Pleau, &c.	Auchenbowie.	John M'Laren, Greenyards.
180.	Craigforth and Touch.	Kingspark.	Alex. Scott, Fallisinch.
181.	Eastern Dist. of Stirlingshire.	Carmuir.	Henry Small, Bonnyfield.
182.	Gargunnoch.	Inch of Leckie.	Robert Inglis, Kipdarroch.
183.	Strathendrick.	Gartness.	James Paul, Drumquharn.

## WIGTOWNSHIRE.

184.	New Luce.	Mains of Larg.	John M'Quistin, Balneil.
185.	Old Luce.	Back of the Wall.	James M'Carlie, Campbell's Croft.
186.	Penningham, &c.	Challoch.	John Monteith, Mains of Machemore.
187.	Rhins of Galloway.	Dunskey.	Alex. Lamb, Gallowhill.

## V.—COTTAGES AND GARDENS.

## 1. BEST KEPT COTTAGES AND GARDENS.

## ABERDEENSHIRE.

<i>Birse</i> .....	Alexander Bowman	Cottage	L.1 and Minor Silver Medal	L.1	6	0
	Alexander Birss	do.			0	10 0
	William Kehman	do.	Minor Silver Medal		0	6 0
	William Kehman	Garden	L.1 and Minor Silver Medal	1	6	0
	William Stewart	do.			0	10 0
	Alexander Bowman	do.	Minor Silver Medal		0	6 0
	John Collie (1st Prize in 1873.)	do.	Minor Silver Medal		0	6 0
<i>Kincardine (1st Prize)</i> ..	James Mathison	Cottage	L.1 and Minor Silver Medal	1	6	0
	James Graham	do.			0	10 0
	James Skinner	do.	Minor Silver Medal		0	6 0
	James Mathison	Garden	L.1 and Minor Silver Medal	1	6	0
	James Philip	do.			0	10 0
	James Skinner	do.	Minor Silver Medal		0	6 0

## EDINBURGHSHIRE.

<i>Dalerno and Currie</i> .....	James Paterson	Garden	L.1 and Minor Silver Medal	1	6	0
	David Gardner	do.			0	10 0
	James Buckle	do.	Minor Silver Medal		0	6 0
	James Morgan (1st Prize in 1870)	do.	Minor Silver Medal		0	6 0

## LANARKSHIRE.

<i>Muirkirk</i> .. . . .	Jeanie Wilson	Cottage	L.1 and Minor Silver Medal	1	6	0
	James Gray	do.			0	10 0
	Robert Heron	do.	Minor Silver Medal		0	6 0
	Robert Heron	Garden	L.1 and Minor Silver Medal	1	6	0
	James Gray	do.			0	10 0
	John Gemmel	do.	Minor Silver Medal		0	6 0

## LINLITHGOWSHIRE.

<i>Dalmeny and Queensferry</i>	Mrs Masterton	Cottage		1	0	0
	Mrs Patterson	do.			0	10 0
	Mrs Begbie	do.	Minor Silver Medal		0	6 0
	Thomas Cochrane	Garden	L.1 and Minor Silver Medal	1	6	0
	Angus Nicolson	do.			0	10 0
	William Hunter	do.	Minor Silver Medal		0	6 0
<i>Kirkliston</i> ... . .	Mrs John Weston	Cottage	L.1 and Minor Silver Medal	1	6	0
	Mrs John Ritchie	do.			0	10 0
	Mrs Alex. Kinnaird	do.	Minor Silver Medal		0	6 0
	John Ritchie	Garden	L.1 and Minor Silver Medal	1	6	0
	John McKenzie	do.			0	10 0
	John Weston	do.	Minor Silver Medal		0	6 0
	Andrew Borthwick	do.	Minor Silver Medal		0	6 0
	(1st Prize in 1873.)					

## PERTHSHIRE.

<i>Auchtermuchty</i> ..	John McLaren	Cottage	L.1 and Minor Silver Medal	1	6	0
	Miss Penney	do.			0	10 0
	James Hutton	do.	Minor Silver Medal		0	6 0
	John Whittet	Garden	L.1 and Minor Silver Medal	1	6	0
	Mrs Dingwall	do.			0	10 0
	Miss Penney	do.	Minor Silver Medal		0	6 0
<i>Dunbarney</i> .. .	Andrew Geddes	Cottage	L.1 and Minor Silver Medal	1	6	0
	John Campbell	do.			0	10 0
	Peter Hood	do.	Minor Silver Medal		0	6 0
	John Campbell	Garden	L.1 and Minor Silver Medal	1	6	0
	Walter Taylor	do.			0	10 0
	Peter Hood	do.	Minor Silver Medal		0	6 0
<i>Dunning</i> .. . . .	James Duncan	do.	L.1 and Minor Silver Medal	1	6	0
	Robert Fergusson	do.			0	10 0
	John Scobie	do.	Minor Silver Medal		0	6 0
<i>Forquarney</i> .. . . .	Archibald Fare	do.	L.1 and Minor Silver Medal	1	6	0

Carry forward, L 35 10 0

				Brought forward,	L.35 10
<i>Forquharry</i> .....	James Christie	Garden			0 10
	Robert Buchan	do.	Minor Silver Medal		0 6
	John Tod (1st Prize in 1873.)	do.	Minor Silver Medal		0 6
<i>Glasgow</i> . . . . .	Helen Sim	Cottage	L.1 and Minor Silver Medal		1 6
	Mary Donaldson	do.			0 10
	Jane Wilkie	do.	Minor Silver Medal		0 6
	Alexander Douglas	Garden	L.1 and Minor Silver Medal		1 6
	Margaret Gollan	do			0 10
	Mary Rae	do.	Minor Silver Medal		0 6
				L.40 16	0

## 2. MEDALS FOR COTTAGES AND GARDENS AND GARDEN PRODUCE.

Medium Silver Medals were awarded to the following:—

ABERDEENSHIRE.			
<i>Cuny</i> .....	George McPherson	Cottage	
	Walter Paterson	Garden	
<i>Crimmonmogate</i> .....	Charles Cranna	Cottage	
	Robert Ritchie	Garden	
<i>Forray</i> . . . . .	Mrs Glennie	Cottage	
	William Low	Garden	
<i>Kelg</i> . . . . .	William Greig	Cottage	
	Lewis Stewart	Garden	
<i>Kinnellar</i> ... . . . .	Mrs Duncan	Cottage	
	Charles Beaton	Garden	
AYRSHIRE.			
<i>Mauchline</i> ..... . . . .	Hugh Wilson	Garden Produce	
DUMBERTONSHIRE.			
<i>Valle of Leven and Dumbarton</i> .....	William Knox	Garden	
	James Miller	Garden	
EDINBURGHSHIRE.			
<i>Roslin</i> .....	John Wright	Garden and Garden Produce	
	Peter Torrance	Flower Plot	
KINCARDINESHIRE.			
<i>Fettercairn</i> .....	David Carnegie	Garden	
	George Allan Dickson	Garden	
<i>Meurms</i> .....	Harry Britten	Garden Produce	
	Alexander Stephen	Garden	
LANARKSHIRE.			
<i>Eastern District of Glasgow</i> .....	John Marshall	Flower Plot	
	James McCrossin	Garden	
<i>Hutchesontown Gardens</i> .....	James Leith, jun.	Garden Produce	
	Samuel Allison	Flower and Vegetable Plot	
<i>Victoria Gardens, Glasgow</i> .....	Robert Ferguson	Flower and Vegetable Plot	
	Alexander C. Todd	Flower and Vegetable Plot	
<i>Shettleston</i> .....	John Stoddart	Collection of Flowers	
	John Stoddart	Collection of Vegetables	
<i>Uddingston</i> .....	Thomas Nelson	Cottage	
	Edward Boyes	Garden	
LINLITHGOWSHIRE.			
<i>Ecclesmachan</i> .....	David Kidd	Cottage	
	Peter Maxwell	Garden	
PEEBLES SHIRE.			
<i>West Linton</i> .....	Robert Forrest	Garden	
PERTHSHIRE.			
<i>Logiealmond and Glenalmond</i> .....	Robert Wilson	Cottage	
	Robert Wilson	Garden	
<i>Stiosgarbh</i> .....	Ewan Cameron	Garden Produce	
<i>Weem and Breadalbane</i> .....	George Stewart	Garden	

36 Medium Silver Medals, L.18, 18s.

## VI. VETERINARY DEPARTMENT.

## ANNUAL EXAMINATION—APRIL 1874.

Edwin Faulkner, Manchester,	General Examination,	Med. Gold Medal,	L.6	2	0
A. H. Darwell, Northwich,	Practical Examination,	Med. Gold Medal,	6	2	0
Edwin Faulkner, Manchester	Do.	Silver Medal,	0	16	0
R. W. Matthews, Alford, Lincoln,	Do.	Silver Medal,	0	16	0

## CLASS EXAMINATIONS—APRIL 1874.

## EDINBURGH VETERINARY COLLEGE.

William Gladstone, Yetholm,	Horse Pathology,	Silver Medal,	0	16	0
Do. do.	Comparative Pathology,	Silver Medal,	0	16	0
Do. do.	Anatomy,	Silver Medal,	0	16	0
John Corbett, Simonburn,	Physiology,	Silver Medal,	0	16	0
Do. do.	Chemistry,	Silver Medal,	0	16	0
Do. do.	Materia Medica and Toxicology,	Silver Medal,	0	16	0
J. H. U. Dewar, Midmar,	General Proficiency,	Silver Medal,	0	16	0

## NEW VETERINARY COLLEGE, EDINBURGH.

William Anderson, Keith,	Horse Pathology,	Silver Medal,	0	16	0
C. P. Lyman, Boston, U.S.,	Cattle Pathology,	Silver Medal,	0	16	0
Edwin Faulkner, Manchester,	Anatomy,	Silver Medal,	0	16	0
Do. do.	Physiology,	Silver Medal,	0	16	0
Thomas Gibson, Ferniehurst,	Chemistry,	Silver Medal,	0	16	0
G. H. Fenton, Doncaster, and	Materia Medica,	Silver Medal,	0	16	0
S. L. Ragg, Sheffield,		Silver Medal,	0	16	0

## GLASGOW VETERINARY COLLEGE.

Samuel Gillespie, Ballymena,	Physiology and Histology,	Silver Medal,	0	16	0
Do. do.	Diseases of Cattle, &c.,	Silver Medal,	0	16	0
James Cochrane, Lanark,	Diseases of Horses,	Silver Medal,	0	16	0

## CLASS EXAMINATIONS—JULY 1874.

## EDINBURGH VETERINARY COLLEGE.

W. C. McCracken, Whithorn,	Botany,	Silver Medal,	0	16	0
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## NEW VETERINARY COLLEGE, EDINBURGH.

William Barnes, Tarporley,	Anatomy,	Silver Medal,	0	16	0
Robert Moore, West Brunton,	Chemistry,	Silver Medal,	0	16	0
John W. Marsland, Staleybridge,	Materia Medica,	Silver Medal,	0	16	0
J. O'Sullivan, Cork,	Botany,	Silver Medal,	0	16	0

## GLASGOW VETERINARY COLLEGE.

G. H. Elder, Angus,	Anatomy,	Silver Medal,	0	16	0
John B. Moore, Glasgow,	Chemistry,	Silver Medal,	0	16	0
John Bryce, Stirling,	Materia Medica,	Silver Medal,	0	16	0
William Semple, Glasgow,	Botany,	Silver Medal,	0	16	0

L.34 12 0

## VII. AGRICULTURAL CLASS, EDINBURGH UNIVERSITY.

John Bramwell, Blackaddie, Sangnhar, and	Equal {	.	.	.	L.5	0	0
Robert W. E. Murray, Housebyres, Galashiels,		.	.	.	5	0	0

L.10 0 0

## ABSTRACT OF PREMIUMS.

1. ESSAYS AND REPORTS—Money Premiums and Medals,	.	.	.	L.125	1	0
2. STIRLING SHOW, 1873,	.	.	.	0	16	0
3. INVERNESS SHOW—Money Premiums and Medals,	.	.	.	1819	6	6
4. DISTRICT SHOWS:—						
Stock,	.	.	.	L.434	0	0
Dairy Produce,	.	.	.	7	2	0
Special Grants—Edinburgh Christmas Club, L.50; Ayrshire Association, L.20,	.	.	.	70	0	0
Local Societies—Medals in aid of Premiums, given by (307),	.	.	.	161	3	6
Ploughing Associations—Medals to (187),	.	.	.	56	2	0
				728	7	6
5. COTTAGES AND GARDENS—Money Premiums and 41 Minor Silver Medals,						
L.40, 16s; 36 Medium Silver Medals, L.18, 18s.,	.	.	.	59	14	0
6. VETERINARY DEPARTMENT—Medals to Students,	.	.	.	34	12	0
7. AGRICULTURAL CHAIR, EDINBURGH UNIVERSITY—Prizes to Class,	.	.	.	10	0	0

L.2777 17 0

**STATE OF THE FUNDS**  
OF  
**THE HIGHLAND AND AGRICULTURAL SOCIETY**  
**At 30th NOVEMBER 1874.**

## I. INVESTMENTS ON BONDS—

Heritable Bonds, . . . . .	£12,279 16 0
Railway Debenture Bonds, . . . . .	10,500 0 0
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	£22,779 16 0

## II. DEBENTURE STOCK—

£3000 North British Railway 4½ per cent. Debenture Stock, at £105, . . . . .	3,150 0 0
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## III. VALUE OF BANK STOCKS at 30th November 1874—

£2,218, 6s. 5d. Bank of England Stock, at £256, £5,678 18 0	
6,102, 7s. 8d. Royal Bank of Scotland Stock, at £231, . . . . .	14,096 10 1
2,000, 0s. 0d. British Linen Co. Bank Stock, at £288, . . . . .	5,760 0 0
1,062, 10s. 0d. Commercial Bank of Scotland, at £317, . . . . .	3,368 2 6
1,250, 0s. 0d. National Bank of Scotland, at £318, . . . . .	3,975 0 0
	<hr/>
	32,378 10 7
£12,633, 4s. 1d.	

*Note.*—The original cost of these Bank Stocks was £18,154, 9s. 8d.,  
showing a profit at present prices of £14,724, 0s. 11d.

## IV. TEN SHARES (£500) OF THE BRITISH FISHERY SOCIETY, valued at 200 0 0

## V. ARREARS OF MEMBERS, CONSIDERED RECOVERABLE, . . . 45 18 6

## VI. BALANCE DUE BY ROYAL BANK ON CURRENT ACCOUNT, . . . 285 19 2

	£59,340 4
<i>Deduct</i> —Due to Building Fund, as below, . . . . .	654 11

AMOUNT OF FUNDS, £58,685 13 0

## VII. BUILDING FUND—

1. Estimated Value of Buildings, No. 3 George IV. Bridge, . . .	£3,100 0 0
2. Sum invested in Railway Debenture Bond, . . . . .	1,000 0 0
3. Due by General Funds as above, being deposited with Royal Bank at 30th November 1873, £598, 5s. 1d., and Interest on Building Fund for year, £56, 6s. 2d., . . . . .	654 11 3
	<hr/>
	£4,754 11 3

## VIII. FURNITURE—

Estimated Value of Furniture, Paintings, Books, &c., . . . . .	£1,000 0 0
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ANTHONY MURRAY, *Convener of Finance Committee.*  
GRAHAM BINNY, *Member of Finance Committee.*  
KENNETH MACKENZIE, C.A., *Auditor.*

# **ABSTRACT of the ACCOUNTS of the HIGHLAND and CHARGE.**

1. BALANCE due by the Royal Bank of Scotland at 30th November 1873,	£244	11	3
2. SUM in Deposit Receipt with Royal Bank of Scotland of date 13th November 1873,	500	0	0
3. SUM deposited with Royal Bank of Scotland on account of Building Fund,	598	5	1
4. ARREARS of Annual Subscriptions outstanding at 30th November 1873,	£38	15	6
Whereof due by Members compounding for life, and thereby extinguished, £5, 7s. 0d.; since ordered to be written off as irrecoverable, £18, 8s.,	23	15	0
		15	0
5. ARREARS of Stall Rents from Stirling Show, . . . . .		4	0
6. INCOME FROM INVESTMENTS—			
(1.) Interest on Heritable Bonds—			
On £10,979 16 0 at 4 per cent., . . . . .	£430	3	8
1,300 0 0 at 4½ per cent., . . . . .	58	10	0
	£12,279	16	0
Less Income Tax, . . . . .	4	19	0
	£492	14	8
(2.) Interest on Debenture Bonds at 4 per cent.—			
On £10,000 for year, . . . . .	£400	0	0
500 from 1st August 1873 to 11th November 1874,	25	14	0
	£10,500	425	14 0
Less Income Tax, . . . . .	4	8	11
		421	5 1
(3.) Interest on £3000 Debenture Stock at 4½ per cent., . . . . .	£127	10	0
Less Income Tax, . . . . .	1	6	6
		126	3 6
(4.) Interest on Bank Account, . . . . .		4	15 5
(5.) Interest on Deposit Receipt of £500 with Royal Bank of Scotland, for half-year to 14th May 1874,		7	11 8
(6.) Dividends on Bank Stock—			
On £2,218 6 5 Bank of England, . . . . .	£221	17	6
6,102 7 8 Royal Bank of Scotland, . . . . .	564	9	6
2,000 0 0 British Linen Co. Bank, . . . . .	260	0	0
1,062 10 0 Commercial Bank, . . . . .	164	13	9
1,250 0 0 National Bank of Scot., . . . . .	200	0	0
		1,411	0 9
£12,633 4 1			
(7.) Dividend on £500 Stock of the British Fishery Society, . . . . .			
Note.—Owing to exceptional circumstances, no Dividend has this year been paid on this Stock.			
		2,463	14
7. INCOME FROM BUILDING FUND—			
Interest on Debenture Bond for £1000 at 4 per cent., . . . . .	£39	11	8
£40, less tax, 8s. 4d., . . . . .			
Interest on Deposits with Royal Bank of Scotland—			
On £598, 5s. 1d., for half-year to Whitsunday 1874, . . . . .	£9	10	0
On £627, 10s. 1d., for half-year to Martinmas 1874, . . . . .	7	4	6
		16	14 6
		56	6 2
8. SUBSCRIPTIONS—			
Annual Subscriptions, . . . . .	£799	15	6
Life Subscriptions, . . . . .	1009	4	0
		1,808	19 6
9. SUBSCRIPTIONS to Chemical Department, . . . . .		54	10 0
10. RECEIPTS from Inverness Show (exclusive of premiums), per separate States, . . . . .		417	11 1
SUM OF CHARGE,	£6,159	1	8



# AGRICULTURAL SOCIETY of SCOTLAND for the YEAR 1873-74.

## DISCHARGE.

1. ESTABLISHMENT EXPENSES, viz.—	
Salary to Secretary for year to Martinmas 1874,	£850 0 0
Clerk, £300; Junior Clerk, £127, 10s., for year to 1st October 1874,	427 10 0
Messenger, £70, 10s., and allowance to Widow of former Messenger, £21,	91 10 0
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Fen-Duty, £28; Taxes, £37. 3s. 10d.; Water Duty, £1, 10s.,	£1,369 0 0
Coals and Coke, £13, 1s.; Gas, £6. 9s. 11d.; Insurance Premium, £3, 17s. 6d.,	66 13 10
Repairs, Painting, and Furnishings, £29, 17s. 7d.; Sweeping Vents, 17s.,	23 8 5
	30 14 7
	<hr/>
	£1,489 16 10
2. FEE to Auditor of Accounts, for year to 30th November 1873,	50 0 0
3. FEE to Practical Engineer for half-year to 1st July 1874,	10 0 0
4. FEES to Examiners,	22 12 4
5. AGRICULTURAL CHAIR—	
Grant to Professor, £150; Prizes to Class, £10,	160 0 0
6. CHEMICAL DEPARTMENT—	
Salary to the late Professor Anderson. Glasgow, £300; Assistant for year, £150,	450 0 0
7. VETERINARY DEPARTMENT—	
Allowance to Professor of Veterinary Surgery, £26, 5s; to Professor of Cattle Pathology, £100; Medals to Students, £34, 12s.,	160 17 0
8. SOCIETY'S TRANSACTIONS—Printing, Binding, and Circulating Transactions, £445, 1s. 9d., less Sum received for Sale of Transactions, £31, 11s. 1d.,	413 10 8
9. ORDINARY PRINTING and Lithographing, £39; Advertising, £69, 4s. 8d.; Stationery, &c., £42, 16s.; Postage and Receipt Stamps, £43, 10s.; Bank and Post Office Charges and Telegrams, £4, 16s. 10d.; Business Accounts, £1, 15s. 2d.,	251 2 8
10. TRAVELLING EXPENSES of the Secretary, attending Meetings,	13 5 0
11. SUBSCRIPTIONS to Public Societies—Scottish Meteorological Society, £20; Society for Prevention of Cruelty to Animals, £5,	25 0 0
12. PAINTINGS of Animals by Gourlay Steell, Esq., R.S.A.,	80 0 0
13. MISCELLANEOUS PAYMENTS—Reporting General Meetings, £3, 3s.; Handsels, £1, 4s. 6d.; Refreshments to Examiners, £3, 9s.; Hire of Van, &c., 15s. 6d.; Vote for Illumination of Hall on occasion of Marriage of H.R.H. The Duke of Edinburgh, £25; Repairing Poultry Fronts, £6, 16s.; Re-engraving Medals, 15s. 6d.; Posting Bills, 4s. 6d.; Travelling Expenses of Judge, 10s. 6d.,	41 15 6
14. PREMIUMS—	
Kelso Show, 1872,	£13 10 6
Stirling Show, 1873,	205 4 0
Inverness Show, 1874,	1519 16 6
District Competitions, 1873,	555 8 0
Ploughing Competitions, 1873-74,	56 2 0
Vote to Edinburgh Christmas Club, 1873,	50 0 0
Vote to Ayrshire Agricultural Association, 1873,	20 0 0
Vote to Unst Society, 1873,	20 0 0
Essays and Reports, 1873,	189 8 0
	<hr/>
	2,629 9 0
15. ARREARS of Subscriptions to be struck off as irrecoverable,	29 12 0
16. ARREARS of Subscriptions considered recoverable,	45 18 6
17. BALANCE in Royal Bank of Scotland at 30th November 1874,	235 19 2
	<hr/>
SUM OF DISCHARGE,	£6,159 1 8

ANTHONY MURRAY, *Convener of Finance Committee.*  
 GRAHAM BINNY, *Member of Finance Committee.*  
 KENNETH MACKENZIE, C.A., *Auditor.*

EDINBURGH, 6th January 1875.

# **ABSTRACT OF ACCOUNTS— CHARGE.**

## 1. LOCAL SUBSCRIPTIONS—

### Voluntary Assessment on Proprietors—

Inverness-shire, . . . . .	£567	19	5
Elginshire, . . . . .	206	13	2
Ross-shire, . . . . .	240	0	9
Cromartyshire, . . . . .	9	19	3
Caithness-shire, . . . . .	159	0	0
Sutherlandshire, . . . . .	50	0	0
Nairnshire, . . . . .	66	3	8
Town of Inverness, . . . . .	50	0	0

£1,349 16 3

### Local Societies—

Black Isle Society, . . . . .	£25	0	0
North and West of Sutherland Farmers' Club, . . . . .	5	0	0
Sutherland Farmers' Club, . . . . .	20	0	0
Caithness Farmers' Society, . . . . .	10	0	0
Wester Ross Farmers' Club, . . . . .	25	0	0
Nairnshire Farmers' Society, . . . . .	20	0	0
	<hr/>	105	0 0

£1,454 16 3

## 2. AMOUNT COLLECTED DURING THE SHOW—

Drawn at Gates, . . . . .	£906	3	0
Drawn at Horse Ring, . . . . .	90	9	6
Catalogues and Awards sold, . . . . .	124	6	0
Drawn at Lecture on Plant Life, . . . . .	0	14	6
	<hr/>	1,121	13 0

3. RENT OF STALLS, . . . . .	687	5	0
4. RENT OF REFRESHMENT BOOTHS, . . . . .	87	10	0
5. RENT OF ATTENDANTS' ACCOMMODATION, . . . . .	25	10	0
6. MANURE SOLD IN YARD, . . . . .	12	0	0
7. INTEREST FROM ROYAL BANK, . . . . .	3	19	9

£3,392 14 0

BALANCE, . . . . . 1,102 5 5

£4,494 19 5

NOTE.—To the above Balance of . . . . . £1,102 5 5

There must be added the Premiums un-  
drawn at 30th November, amounting to 299 10 0

Making the probable expense to the Society, £1,401 15 5

## INVERNESS SHOW, 1874.

## DISCHARGE.

## 1. SHOW-YARD EXPENDITURE—

Fitting up, £1,491.—Rent of Seafeld Park, £126.—		
Customs on Stock and Implements, £52, 10s.—		
Water Supply to Yard, £10.—Fire Brigade,		
£2, 10s.—Miscellaneous, £1, 7s. 11d., . . .		£1,683 7 11
2. FODDER and Bedding for Stock, . . . . .		219 6 4
3. POLICE FORCE and Detectives, . . . . .		32 15 5
4. TRAVELLING EXPENSES of Judges, Secretary, &c., . . . . .		264 5 6
5. HOTEL and other bills for Directors, Judges, &c., . . . . .		300 10 3
6. TICKETS for President's Dinner for do., . . . . .		28 14 0
7. MUSIC in Show-Yard, at Dinner, &c., . . . . .		68 4 1
8. PRINTING Catalogues, Awards, &c., and Lithographing		
Tickets, Badges, &c., . . . . .		179 0 0
9. ADVERTISING and Posting Bills, . . . . .		66 12 6
10. ALLOWANCE to Local Secretary, £21.—to Practical		
Engineer, £18, 18s.—and to Local Veterinary In-		
spector, £10, . . . . .		49 18 0
11. ASSISTANTS, Porters, and Attendants, . . . . .		41 10 0
12. POSTAGE and Receipt Stamps, . . . . .		24 10 0
13. MISCELLANEOUS OUTLAYS, £6, 12s., and Chemicals for		
Lecture on Plant Life, £9, 16s. 11d., . . . . .		16 8 11

AMOUNT OF GENERAL EXPENSES, £2,975 2 11

14. PREMIUMS AWARDED, . . . . .	£1,819 6 6	
Less those still undrawn, . . . . .	299 10 0	
		<hr/>
		1,519 16 6

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£4,494 19 5

ANTHONY MURRAY, *Convener of Finance Committee.*

GRAHAM BINNY, *Member of Finance Committee.*

KENNETH MACKENZIE, C.A., *Auditor.*

# **ABSTRACT of the ACCOUNTS of the ARGYLL NAVAL FUND for 1873-74.**

## **CHARGE.**

### **1. FUNDS as at 30th November 1873—**

#### **LOANS—**

On Heritable Bonds, . . . . .	£3,000	0	0
On Debenture Bond by Caledonian Railway Company, . . . . .	1,000	0	0

£4,000 0 0

DEBENTURE STOCK of the North British Railway Co., . . . . .	1,200	0	0
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£5,200 0 0

BALANCE in Bank at 30th November 1873, . . . . .	321	11	6
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£5,521 11 6

### **2. INCOME received—**

On £3,000 Heritable Bond at 4 per cent., £120; less Tax, £1, 3s. 11d., . . . . .	£118	16	1
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On £1,200 North British Railway Debenture Stock at $4\frac{1}{4}$ per cent., £51; less Tax, 10s. 7d., . . . . .	50	9	5
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On £1,000 Debenture Bond by Caledonian Railway Company at 4 per cent., £40; less Tax, £8s. 4d., . . . . .	39	11	8
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£208 17 2

On Bank Account for year to 30th Novem- ber 1874, . . . . .	2	19	2
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211 16 4

**SUM OF CHARGE, £5,733 7 10**

## **DISCHARGE.**

### **1. ALLOWANCES to the following Five Recipients—**

Samuel Ewing, twelfth year, . . . . .	£40	0	0
Everard Ellison Maxwell, eleventh year, . . . . .	40	0	0
George Pirie, eighth year, . . . . .	40	0	0
Andrew F. Balfour, third year, . . . . .	40	0	0
Robert A. J. Montgomerie, second year, . . . . .	40	0	0

£200 0 0

### **2. FUNDS as at 30th November 1874—**

#### **LOANS—**

On Heritable Bond, . . . . .	£3,000	0	0
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On Debenture Bond by Caledonian Railway Company, . . . . .	1,000	0	0
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£4,000 0 0

DEBENTURE STOCK of the North British Rail- way Company, . . . . .	1,200	0	0
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£5,200 0 0

BALANCE in Bank at 30th November 1874, . . . . .	333	7	10
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5,533 7 10

**SUM OF DISCHARGE, £5,733 7 10**

ANTHONY MURRAY, *Convener of Finance Committee.*

GRAHAM BINNY, *Member of Finance Committee.*

KENNETH MACKENZIE, C.A., *Auditor.*

EDINBURGH, 6th January 1875.

# APPENDIX (B).

## PREMIUMS

OFFERED BY

### THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND IN 1875.

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## GENERAL NOTICE.

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THE HIGHLAND SOCIETY was instituted in the year 1784, and established by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Boards of management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have, for the greater part of a century, been directed to the promotion of the science and practice of agriculture in all its branches.

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The leading purposes of the Institution are set forth in the following pages, where it will be found that Premiums are offered for Reports on almost every subject connected with the cultivation of the soil, the rearing and feeding of stock; the management of the dairy; the improvement of agricultural machinery and implements; the growth of timber; the extension of cottage accommodation; the application of chemical science; and the dissemination of veterinary information.

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c., held in the principal towns of Scotland, at which exhibitors from all parts of the United Kingdom are allowed to compete.

2. A system of District Shows instituted for the purposes of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Associations.

3. The promotions of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising "The COUNCIL of the HIGHLAND AND AGRICULTURAL SOCIETY ON EDUCATION" to grant Diplomas to Students of Agriculture.

4. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise.

5. The appointment of a Board of Examiners, and the granting of First and Second Class Certificates in Forestry.

6. The appointment of a Chemist for the purpose of promoting the application of science to agriculture. Investigations on subjects of importance are conducted in the Laboratory, and published in the Transactions.

7. The annual publication of the Transactions, which comprehend the Prize Reports, proceedings in the Laboratory and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications approved of by the Society.

## CONSTITUTION AND MANAGEMENT.

The general business of THE HIGHLAND AND AGRICULTURAL SOCIETY is conducted under the sanction and control of a Royal Charter, which authorises the enactment of Bye-Laws. Business connected with Agricultural Education is conducted under the authority of a Supplementary Royal Charter, also authorising the enactment of Bye-Laws.

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty Ordinary and Ten Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers.

The Directors meet on the first Wednesday of each month from November to June. The proceedings of the Directors are reported to General Meetings of the Society, held in January and in June or July.

With reference to motions at General Meetings, Bye-Law No. 7. provides—"That at General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision, unless notice thereof has been given a week previously to the Board of Directors, without prejudice, however, to the competency of making such motion or proposal to the effect of its being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting."

The Council on Education, under the Supplementary Charter, consists of Sixteen Members—Nine nominated by the Charter, and Seven elected by the Society. The Board of Examiners consists of Ten Members.

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June or July. The ordinary subscription is L.1, 3s. 6d. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from L.12, 12s. to L.7, 1s. Proprietors farming the whole of their own lands, whose assessment on the valuation Roll does not exceed L.500 per annum, and all Tenant-Farmers, Office-bearers of Local Agricultural Associations, Resident Agricultural Factors, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding L.500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying according to the number of previous annual payments, from L.5, 5s. to L.3. According to the Charter, a Member who homologates his Election by paying his first subscription cannot retire until he has paid in annual subscriptions, or otherwise, an amount equivalent to a life composition. Members having Candidates to propose are requested to state whether the Candidate should be on the L.1, 3s. 6d. or 10s. list.

Members of the Society are entitled to apply for District Premiums—to report Ploughing Matches for the Medal—to attend Shows free of charge, and to exhibit Stock at reduced rates.

Orders, payable at the Royal Bank of Scotland, Edinburgh, are issued by the Directors, in name of the parties in whose favour Premiums have been awarded.

All communications must be addressed to "FLETCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 GEORGE IV. BRIDGE, EDINBURGH."



## ESTABLISHMENT FOR 1875.

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MOST NOBLE THE MARQUIS OF BUTE.  
MOST NOBLE THE MARQUIS OF LORNE, K.T., M.P.  
RIGHT HON. THE EARL OF GLASGOW.

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- |                                   |   |
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| 2. <i>Argyll Naval Fund,</i>      | Admiral Sir WM. J. HOPE JOHNSTONE, K.C.B.   |
| 3. <i>Chemical Department,</i>    | Sir THOMAS BUCHAN HEPBURN of Smeaton, Bart. |
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| 5. <i>District Shows,</i>         | A. CAMPBELL SWINTON of Kimmerghame.         |
| 6. <i>Finance,</i>                | ANTHONY MURRAY of Dolerie.                  |
| 7. <i>Forestry Department,</i>    | Professor BALFOUR.                          |
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GEORGE HOPE of Bordlands, Lamancha.  
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P. B. SWINTON, Holyn Bank, Gifford.  
ROBERT HUTCHISON of Carlowrie, Kirkliston.  
BRYDEN MONTEITH, Tower Mains, Liberton.  
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 ROBERT HUTCHISON of Carlowrie, Kirkliston.  
 C. J. MACKENZIE of Portmore, Eddleston.  
 H. D. ERSKINE of Cardross, Stirling.

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 Sir GEORGE MACPHERSON GRANT of Ballindalloch, Bart.  
 DAVID STEVENSON, C.E., Edinburgh.  
 Professor WILSON, Edinburgh.  
 JOHN GIBSON, Woolmet, Dalkeith.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 ALEXANDER YOUNG, Keir Mains, Dunblane.  
 WILLIAM FORD, Hardengreen, Dalkeith.  
 ANDREW MITCHELL, Alloa.  
 JAMES W. HUNTER of Thurston, Dunbar.  
 ROBERT WILSON, Durn, Perth.  
 THOMAS D. FINDLAY of Easterhill, Tolleross, Glasgow.  
 CHARLES HOWATSON of Dornel, Daldorch House, Mauchline.  
 JAS. JOHNSTONE of Bodesbeck, Capplegill, Moffat.  
 J. M. MARTIN, jr. of Auchendennan, Bloomhill, Cardross.

## 9. HALL AND CHAMBERS.

JOHN ORD MACKENZIE of Dolphinton, *Convener.*  
 Sir JAMES GARDINER BAIRD of Saughton Hall, Bart.  
 ANTHONY MURRAY of Dolerie.  
 GRAHAM BINNY, W.S., Edinburgh.  
 ADAM CURRIER, The Lee, Edinburgh.  
 J. PETTIGREW WILSON of Polquhairn.  
 DAVID STEVENSON, C.E., Edinburgh.  
 WILLIAM S. WALKER of Bowland.  
 JOHN GIBSON, Woolmet, Dalkeith.  
 ALEXANDER DICKSON, Hermiston.

## 10. LAW.

GRAHAM BINNY, W.S., Edinburgh, *Convener.*  
 JOHN ORD MACKENZIE of Dolphinton, W.S., Edinburgh.  
 WILLIAM S. WALKER of Bowland.  
 ANTHONY MURRAY of Dolerie, W.S., Edinburgh.  
 HEW CRICHTON, S.S.C., Edinburgh.  
 GEORGE AULDJO JAMIESON, C.A., Edinburgh.

## 11. MACHINERY.

JAMES W. HUNTER of Thurston, *Convener*.  
 DAVID STEVENSON, C.E., Edinburgh.  
 JOHN GIBSON, Woolmet, Dalkeith.  
 Professor WILSON, Edinburgh.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 PATRICK SMALL KEIR of Kindrogan, Pitlochry.  
 JOHN MUNRO, Fairnington, Kelso.  
 P. B. SWINTON, Holyn Bank, Gifford.  
 T. R. B. LESLIE MELVILLE CARTWRIGHT, Melville House, Ladybank.  
 C. J. MACKENZIE of Portmore, Eddlestone.  
 ROBERT WILSON, Durn, Perth.  
 ROBERT HUTCHISON of Carlowrie, Kirkliston.  
 JOHN DOVE, Crosshall, Coldstream.  
 THOMAS D. FINDLAY of Easterhill, Tollcross, Glasgow.  
 ARTHUR GLENNIE, Fernyflatt, Bervie.

## 12. ORDNANCE SURVEY.

ROBERT DUNDAS of Arniston, *Convener*.  
 C. J. MACKENZIE of Portmore, Eddlestone.  
 WILLIAM S. WALKER of Bowland

## 13. PUBLICATIONS.

ALEXANDER FORBES IRVINE of Drum, *Convener*.  
 Professor BALFOUR, Edinburgh.  
 WILLIAM S. WALKER of Bowland  
 ROBERT P. NEWTON of Castlandhill, Polmont Bank, Falkirk.  
 DAVID MILNE HOME of Wedderburn.

## 14. STEAM CULTIVATION.

The MARQUIS of TWEEDDALE, K.T., *Convener*.  
 Hon. GEORGE WALDEGRAVE LESLIE, Leslie House, Leslie.  
 Sir THOMAS BUCHAN HEPBURN of Smeaton, Bart., Prestonkirk.  
 DAVID STEVENSON, C.E., Edinburgh.  
 Professor WILSON, Edinburgh.  
 J. W. HUNTER of Thurston, Dunbar.  
 JOHN GIBSON, Woolmet, Dalkeith.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 P. B. SWINTON, Holyn Bank, Gifford.  
 ARTHUR GLENNIE, Fernyflatt, Bervie.  
 JOHN DOVE, Crosshall, Coldstream.  
 JOHN MUNRO, Fairnington, Kelso.

## 15. VETERINARY DEPARTMENT.

Captain TOD of Howden, *Convener*.  
 Hon. G. R. VERNON, Auchans House, Kilmarnock.  
 Sir ALEXANDER C. R. GIBSON MAITLAND of Clifton Hall, Bart.  
 ANDREW GILLON of Wallhouse, Bathgate.  
 WILLIAM S. WALKER of Bowland.  
 ALEXANDER KINLOCH, yr. of Gilmerton, Drem.  
 GEORGE HOPE of Bordlands, Lamanha.  
 THOMAS MYLNE, Niddrie Mains, Liberton.  
 ALEXANDER M'DOUGAL, Granton Mains, Edinburgh.

## SPECIAL COMMITTEES.

1. *Entomological Specimens*.—Robert Scot Skirving, Edinburgh, *Convener*;  
 Professor Wilson; Professor Wyville Thomson; John Wilson, Edington Mains,  
 Chirnside.

2. *Land Improvement*.—The Marquis of Tweeddale, K.T., *Convener*; Charles Smith, Whittingham, Prestonkirk; P. B. Swinton, Holyn Bank, Gifford; Robert Elliot, Laighwood, Dunkeld; Andrew Mitchell, Alloa; Jas. W. Hunter of Thurston, Dunbar.

3. *Transit of Stock*.—Patrick Dudgeon of Cargen, Dumfries, *Convener*; Graham Binny, W.S.; Andrew Gillon of Wallhouse, Bathgate; Alex. Kinloch, yr. of Gilmerton, Drem; R. P. Newton of Castlandhill; John Ord of Muirhouse-law; W. S. Walker of Bowland; Archibald Campbell Swinton of Kimmerghame, Dunse; Alex. F. Irvine of Drum; David Milne Home of Wedderburn.

The President, Vice-Presidents, Treasurer, and Honorary Secretary, are members *ex officio* of all Committees.

## AGRICULTURAL EDUCATION.

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

### *Members of Council named by Charter.*

The PRESIDENT of the HIGHLAND AND AGRICULTURAL SOCIETY—*President*.  
The LORD JUSTICE-GENERAL—*Vice-President*.

The LORD ADVOCATE.

The DEAN of FACULTY.

The PROFESSOR of AGRICULTURE.

The PROFESSOR of ANATOMY.

The PROFESSOR of BOTANY.

The PROFESSOR of CHEMISTRY.

The PROFESSOR of NATURAL HISTORY.

### *Members of Council nominated by Society.*

The DUKE OF BUCCLEUCH, K.G.

Sir WILLIAM GIBSON-CRAIG, Bart.

Sir A. C. R. GIBSON MATTLAND, Bart.

GEORGE HOPE of Bordlands.

JOHN WILSON, Edington Mains.

THOMAS MYLNE, Niddrie Mains.

JAMES W. HUNTER of Thurston.

### EXISTING BYE-LAWS.

I. That, in terms of a Report by the Council on Education, the following Board of Examiners be appointed:—

1. *Science and Practice of Agriculture—Mechanics and Construction*.—Professor Wilson; George Hope of Bordlands; John Wilson, Edington Mains; and Thomas Mylne, Niddrie Mains.
2. *Botany*.—Professor Balfour.
3. *Chemistry*.—
4. *Natural History*.—Professor Wyville Thomson.
5. *Veterinary Surgery*.—Professor Williams.
6. *Field Engineering and Surveying*.—David Stevenson, C.E.
7. *Book-keeping and Accounts*.—Kenneth Mackenzie, C.A.

II. That the examination shall be both written and oral; that the value of the answers shall be determined by numbers; and that the oral examination shall be public.

III. That there shall be two examinations, to be styled respectively the "Certificate Examination," and the "Diploma Examination." The first to be open to candidates not less than eighteen years of age; the second to those who have completed twenty-one years.

IV. That to pass the "Certificate Examination" a candidate must be acquainted with farm accounts, mensuration, and surveying, and must possess a good knowledge of practical agriculture, and a general acquaintance with the elements of botany, chemistry, and natural history.

V. That a certificate in the following terms, signed by the President or Vice-President of the Council on Education, and by the Secretary, shall be granted to candidates passing this examination :—

"We hereby certify that on the \_\_\_\_\_ day of \_\_\_\_\_ A. B. was examined, and has been found to possess a knowledge of farm accounts, mensuration, and surveying, a good knowledge of practical agriculture, and a general acquaintance with the elements of botany, chemistry, and natural history, and that he is therefore entitled to present himself for the further examination, in terms of the regulations, for the Society's diploma."

VI. That to pass the "Diploma Examination" a candidate must be in possession of the certificate, and have attained his twenty-first year, and must be found to possess a thorough knowledge of the theory and practice of agriculture; of mechanics and mensuration; of the physiology and treatment of domesticated animals; and of the application of botany, chemistry, and natural history to agriculture.

VII. That a diploma in the following terms, bearing the corporate seal of the Society, and signed by the President or Vice-President of the Council on Education, and by the Secretary, shall be granted to candidates passing the second examination :—

"These are to certify that, on the \_\_\_\_\_ day of \_\_\_\_\_ A. B. was examined in the arts and sciences connected with agriculture, and has been reported to be proficient therein by a Board of Examiners nominated by the Council of the Highland and Agricultural Society of Scotland on Education, in terms and by authority of a Charter, given under the Great Seal, on the 18th day of August 1856."

VIII. That a sum not exceeding L.100 per annum shall be placed at the disposal of the Examiners, to be applied in prizes to candidates who pass with distinguished merit, and on a standard exceeding that required for the diploma.

IX. That each successful candidate for the Society's Agricultural Diploma shall thereby become eligible to be elected a free life member of the Society.

#### PROPOSED NEW BYE-LAWS.

The following proposed new Bye-Laws were approved of at the General Meeting of the Society held on the 20th of January 1875, and will be submitted to the next General Meeting for confirmation :—

I. That, in terms of the Charter, the Society shall nominate seven members to act on the Council on Education.

II. That the Council shall appoint a Board of Examiners on the following subjects :—Science and practice of agriculture, mechanics and construction; botany; chemistry; natural history; veterinary surgery; field engineering and surveying; and book-keeping and accounts.

III. That the examinations shall be both written and oral, that the value of the answers shall be determined by numbers, and that the oral examinations shall be public.

IV. That there shall be three examinations, to be styled respectively the "Second Class Certificate Examination," the "First Class Certificate Examination," and the "Diploma Examination." The first to be open to candidates not less than seventeen years of age; the second to those who are not less than eighteen; and the third to those who have completed their twenty-first year.

V. That to pass the "Second class certificate examination" a candidate must be acquainted with the principles and practice of agriculture, agricultural chemistry, surveying and farm engineering, and farm accounts; and that a certificate in the following terms, signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination :—

"We hereby certify that on the \_\_\_\_\_ A. B. was examined, and has been found to possess a knowledge of agriculture, agricultural chemistry, surveying and farm engineering, and farm accounts."

VI. That to pass the "First class certificate examination" a candidate must be acquainted with the subjects of the second class certificate and any three of the following subjects :—Botany, geology, physics or mechanics, meteorology or climate, natural history, and veterinary practice; and that a certificate in the following terms, signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination :—

"We hereby certify that on the \_\_\_\_\_ A. B. was examined, and has been found to possess a knowledge of agriculture, agricultural chemistry, surveying and farm engineering, and farm accounts, and that he is therefore entitled to present himself for the further examination, in terms of the regulations, for the Society's Diploma."

VII. That to pass the "Diploma Examination" a candidate must have attained his twenty-first year, and must possess a thorough knowledge of the theory and practice of agriculture, of mechanics and mensuration, of the physiology and treatment of domesticated animals, and of the application of botany, chemistry, and natural history to agriculture; and that a diploma in the following terms, bearing the corporate seal of the Society, and signed by the President or Vice-President of the Council on Education, the Examiners, and by the Secretary, shall be granted to candidates passing this examination :—

"These are to certify that, on the \_\_\_\_\_ day of \_\_\_\_\_ A. B. was examined in the arts and sciences connected with agriculture, and has been reported to be proficient therein by a Board of Examiners nominated by the Council of the Highland and Agricultural Society of Scotland on Education, in terms and by authority of a charter given under the great seal on the 18th day of August 1856."

VIII. That each successful candidate for the Society's Agricultural Diploma shall thereby become eligible to be elected a free life member of the Society.

IX. That the Society shall grant ten bursaries of L.20 each, and five of L.10 each, at schools to be approved of by the Directors, which include or are willing to introduce the teaching of chemistry, and the following branches of natural science—physical geography, botany, and geology, into their curriculum.

X. That the L.20 bursaries shall be tenable for one year at the University of Edinburgh for the purpose of enabling the holders to take the classes necessary to qualify for the Society's Certificate or Diploma; and the L.10 bursaries to be tenable for the same period to enable the holders to receive another year's preparation at the schools.

XI. That the bursaries shall be determined by examination held in Edinburgh by the Society's Examiners.

XII. That a Standing Acting Committee of the Council on Agricultural Education shall be appointed by the Directors.



\*The following gentlemen have passed Examinations :—

FOR DIPLOMA.

1. Jacob Wilson, M.R.A.C., Woodhorn Manor, Morpeth, . . .	1858
2. John Milne, Mains of Laithers, Turriff, . . .	1859
3. William Henry Eley, Islingham, Frindsbury, Rochester, Kent, . .	1859
4. Thomas Rome, M.R.A.C., Northampton Downs, Barcoo River, Queensland, . . .	1859
5. William Norman, M.R.A.C., Hall Bank, Aspatria, . . .	
6. George Campbell, Shanes Castle, Antrim, . . .	1861
7. William B. Smith, M.R.A.C., Stoneleigh Villa, Leamington, . .	1862
8. John R. Hetherington, M.R.A.C., Carleton, Carlisle, . . .	1862
9. William Brown, Factor, Earlsnill, Forres, . . .	1864
10. Arthur James Hill, M.R.A.C., Accountant, London, . . .	1864

FOR CERTIFICATE AND DIPLOMA.

(Under Bye-Laws enacted in 1866.)

11. H. R. Goddard, M.R.A.C., Belsay, Newcastle-on-Tyne, . . .	1866
12. G. Y. Wall, M.R.A.C., Durham, . . .	1866
13. Robert Brydon, The Dene, Seaham Harbour, . . .	1867
14. George Kent Walton, Long Campton, Shipston-on-Stour, . . .	1867
15. Thomas John Elliot, M.R.A.C., Wilton, Salisbury, . . .	1868
16. John Gerrard, Veterinary Infirmary, Market Deeping, . . .	1869
17. Colville Browne, M.R.A.C., Park House, Long Melford, Suffolk, .	1872
18. A. H. Ashdown, M.R.A.C., Uppington, Salop, . . .	1872
19. Adam Ogilvie Torry, St Anne's, Coupar-Angus, . . .	1872
20. Italo Giglioli, M.R.A.C., Florence, . . .	1873
21. Edward Charles Munby, M.R.A.C., Myton Grange, Helperby, Yorkshire, . . .	1873
22. R. F. Jukes, M.R.A.C., Cotwall, Wellington, Salop, . . .	
23. Forbes Burn, Hardacres, Coldstream, . . .	1874
24. Henry Erskine, Dalladies, Brechin, . . .	1874
25. Richard Henderson, Coldstream, . . .	1874

FOR CERTIFICATE.

(Under Bye-Laws enacted in 1866.)

1. J. C. Bowstead, M.R.A.C., Halkthorpe Hall, Penrith, . . .	1867
2. James Taylor, Allan Vale, Pitnuxton, . . .	1868
3. R. C. Bruce Willis, M.R.A.C., 8 Lansdowne Crescent, Cheltenham, .	1873
4. William Kennedy, M.R.A.C., 49 Marine Parade, Brighton, . . .	1874

SYLLABUS OF EXAMINATION.

I.—SCIENCE AND PRACTICE OF AGRICULTURE, MECHANICS, AND CONSTRUCTION.

1. The principles of rotation. Rotations of cropping in most common use for heavy and for light soils. 2. Manures in ordinary use—usual quantities applied per acre—time and mode of application—their composition and relative values and uses. 3. Composition and classification of soils—their agricultural treatment. 4. The various farm crops—their cultivation, general treatment, and marketable value—ordinary produce per acre, and the different

\* Names of those deceased, so far as known, are printed in italics.

modes of storing them. 5. The breeding, rearing, feeding, and humane treatment of the live stock of the farm—the different breeds—their characteristics—the districts where they are principally met with—and also the best and most humane system of horse breaking. 6. Drainage operations. 7. The implements used in agriculture, the points to be attended to in their construction and use, and their prices.

## II.—BOTANY.

1. Nutritive Organs of Plants—Root, stem, leaves. Functions of roots. Various kinds of stems, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs—Flower and its parts. Arrangements of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed, or germination. 3. General Principles of Classification.—Meaning of the terms Class, Order, Genus, Species. Illustrations taken from plants used in agriculture, such as grain-crops, grasses, clovers, vetches, turnips, mangold-wurzel, pease, beans, &c. Practical Examination in fresh Specimens and Models; some of the latter may be seen in the Museum, at the Royal Botanic Garden, which is open daily to the public, free. Text-book—Balfour's "Elements of Botany," published by A. & C. Black, 1869. Price 3s. 6d.

## III.—CHEMISTRY.

### 1. CHEMISTRY.

The laws of chemical combination. Atomic theory. Chemistry of the non-metallic elements, and their more important compounds. Potassium, sodium, calcium, magnesium, iron, and their compounds. Text-book—Roscoe's "Lessons in Elementary Chemistry," published by Macmillan & Co., London. Price 4s. 6d.

### 2. AGRICULTURAL CHEMISTRY.

Composition of Plants. Their organic and inorganic constituents. Composition and characters of fertile soils. The principles of manuring. Composition of farm-yard manure. Artificial manures. Their nature and composition. Principles on which they should be used. Feeding stuffs. Their composition and value, and the mode in which they may be most advantageously employed. Text-books—Anderson's "Elements of Agricultural Chemistry," published by A. & C. Black, Edinburgh. Price 6s. 6d. Johnson's "How Crops Grow," published by Macmillan & Co., London.

## IV.—NATURAL HISTORY.

### 1. ZOOLOGY.

1. The Primary Divisions of the Animal Kingdom, with examples of each. 2. The Vertebrate Kingdom. The peculiarities and functions of the alimentary canal, distinguishing the Ruminants. 3. The Orders—Hymenoptera, Diptera, and Coleoptera—with examples of insects injurious to farm crops belonging to each of the Orders—the preservation of birds which prey upon these insects, drawing a distinction between those which are beneficial and those which are destructive to crops.

### 2. GEOLOGY.

4. The various strata forming the earth's crust in their order of deposition. 5. Their influences on the surface soils of the country. 6. The meaning and application of Disintegration, Drift, Alluvium, Dip, Strike, Fault.

## V.—VETERINARY SURGERY.

1. Anatomy of the digestive organs of horse and ox, describing their structural differences. 2. The process of digestion in the above animals, and food

most proper for each in quantity and quality. 3. The management of stock before, at, and after parturition. The time of utero-gestation in the domesticated animals. 4. The general principles to be followed in the treatment of very acute disease, before assistance of the veterinary surgeon can be procured.

## VI.—FIELD ENGINEERING AND SURVEYING.

1. Land-Surveying with the Chain. 2. Mensuration of Areas of Land, from a Chain Survey or from a Plan. 3. Levelling with the ordinary Levelling Instrument and Staff. Text books—Any one of the following:—Butler Williams' "Practical Geodesy," published by J. W. Parker, London. Price 8s. 6d. Pages 1 to 20, 24 to 28, 30 to 33, 56 to 59, 118 to 132. "Cassell on Land-Surveying," published by Cassell, Petter, & Galpin, London; or "Bruff on Land-Surveying," published by Simpkin & Marshall, London; the parts which relate to chain-surveying and ordinary levelling only.

## VII.—BOOK-KEEPING AND ACCOUNTS.

1. Questions in practice and proportion. 2. Book-keeping—Describe books to be kept. Give examples—taking of stock. Text-book—Stephen's "Practical System of Farm Book-keeping," published by Blackwood & Sons, Edinburgh. Price 2s. 6d.

# VETERINARY DEPARTMENT.

In the year 1823 the Highland and Agricultural Society instituted lectures in Veterinary Science and Medicine, and arranged with the late Professor Dick to conduct the same.

In 1824 Examinations were commenced and Certificates granted, but only to those Students who attended these lectures. Up to the present time 1056 certificates have been issued.

In 1859, the Society resolved that the Students of any Veterinary Teacher in Scotland, established under Her Majesty's sign manual, should be eligible for Examination for the Society's Certificate, and they authorised the Examining Board to take on trial any party duly qualified who made application for the Society's Certificate.

In 1870, the Examinations were opened to the Students of any Veterinary Teacher duly recognised by Government.

In 1872 it was resolved that the Examinations should be conducted under the following regulations:—

1. There are two examinations yearly—one in April, the other in July.
2. Candidates are allowed to present themselves for examination in Anatomy, Materia Medica, Chemistry, and Botany, nine months after the commencement of their professional studies at a Veterinary College recognised by Government.
3. Candidates who have passed the First Examination, and who have attended at least Two Winter Sessions and One Summer Session at a Veterinary College, are allowed to come up for the Second or Final Examinations, which embrace Histology, Physiology, Cattle Pathology, Horse Pathology, and Clinical Medicine.
4. Candidates must pass a Practical Clinical Examination before they are taken on the subjects enumerated in No. 3.

5. Candidates in entering their names for the Final Examinations must produce Certificates that they have attended a Course of at least Three Sessions at a Veterinary College recognised by Government, the last of these Sessions being the one immediately preceding the Examinations, and also produce Certificates from the Professor of each subject required by the Curriculum.

6. Candidates failing to pass any of the Examinations are required to attend a Veterinary College one Session before being allowed to present themselves for Re-examination.

7. Candidates who are members of the Medical Profession, or of any Colonial or Foreign Veterinary School or College, are allowed to present themselves for Examination after attending one Winter Session at a Veterinary College in this country, and receive the Certificate on passing the Final or Major Examination only.

In 1874 the Society resolved to vote a certain number of Silver Medals to each of the two Veterinary Colleges in Edinburgh, and to the one in Glasgow, for Class Competition; and two Medium Gold Medals, open to all the Students who come up to the April Examination for the Society's Veterinary Certificate for best general and best practical Clinique Examinations.

The examinations are conducted by leading members of the Medical Faculty and of the Veterinary Profession; and a Certificate in the following terms, bearing the arms of the Society, and signed by the Examiners, is granted to those Students who pass the required Examinations:—

#### HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

##### *Veterinary Examination.*

*At Edinburgh, the      day of      18*

These are to certify that      has attended  
as a student during the period prescribed by the regulations established by  
the Directors of the Society, and, having been examined by us, we consider  
him duly qualified to practise the Veterinary Art.

#### BOARD OF EXAMINERS—APRIL 1874.

1. *Anatomy and Physiology.*—Dr Dumbreck, Edinburgh; Dr Charles Dyce, Edinburgh; Thomas A. Dollar, London; C. Cunningham, Slateford.
2. *Chemistry and Materia Medica.*—Professor Douglas MacLagan, Edinburgh; Professor Balfour, Edinburgh; Finlay Dun, Weston Park; Dr Wm. Craig, Edinburgh.
3. *Diseases of Horses.*—Thomas Taylor, Manchester; John Lawson, Manchester; C. Cunningham, Slateford; John Borthwick, Kirkliston.
4. *Diseases of Cattle, Sheep, Swine, and Dogs.*—John Steele, Biggar; William Aitken, Kilmarnock; A. Pottie, Paisley.
5. *Practical Examination.*—T. A. Dollar, New Bond Street, London; Thomas Taylor, Manchester; John Lawson, Manchester; Finlay Dun, Weston Park, Shipston-on-Stour, Warwickshire; John Steele, Biggar; John Borthwick, Kirkliston.

#### BOARD OF EXAMINERS—JULY 1874.

1. *Anatomy.*—Dr Dyce; Dr Dumbreck; and C. Cunningham, Slateford.
2. *Botany and Materia Medica.*—Dr Balfour, Edinburgh; and Alex. Inglis M'Callum, Edinburgh.
3. *Chemistry.*—Dr W. Craig, Edinburgh; and Andrew Spreull, Dundee.

## SYLLABUS OF VETERINARY EXAMINATION.

## ANATOMY AND PHYSIOLOGY.

Anatomy of bones, muscles, blood-vessels, nerves, and viscera of horse, cow, and dog. Description of relative position of parts displayed by various dissections. Demonstration from actual specimens of muscles, tendons, blood-vessels, and nerves, of horse's limbs, larynx, eye, &c. Comparative anatomy of veterinary patients. Minute anatomy of bone, blood, lung, and other tissues of inflammatory products, and of tumours. Processes of digestion, circulation, respiration, secretion, and excretion. Functions of nervous system and of reproduction. The breeding, rearing, feeding, and humane treatment of the live stock of the farm—the different breeds—their characteristics—the districts where they are principally met with—and also the best and most humane system of horse-breaking. Text-books—Chauveau's "Comparative Anatomy of the Domesticated Animals," by George Fleming, Veterinary Surgeon, Royal Engineers; Churchill & Sons; price L.1, 11s. 6d. "Lessons in Elementary Physiology," by Thomas H. Huxley, LL.D. and F.R.S.; Macmillan & Co.; 4s. 6d. Strangeways' "Anatomy," MacLachlan and Stewart; 17s. Kirk's "Physiology."

## CHEMISTRY AND MATERIA MEDICA.

Elements of inorganic and organic chemistry; physiological chemistry; testing for commoner metals. Preparation, properties, actions, uses, and doses of medicines. Poisoning in the lower animals, symptoms, post-mortem appearances, antidotes. Writing of prescriptions. Text-books—Roscoe's "Lessons in Elementary Chemistry," Macmillan & Co.; price 4s. 6d. "Veterinarian's Pocket Conspectus," by Thomas Walley, M.R.C.V.S.; Lorimer and Gillies, Edinburgh. "Veterinary Medicines, their Actions and Uses," by Finlay Dun; Edmonstone and Douglas, Edinburgh; 12s. 6d.

## BOTANY.

Structure and functions of nutritive and reproductive organs of plants. Natural families of medicinal and poisonous plants. Diseases of agricultural plants caused by fungi. Text-book—Balfour's "Elements of Botany," A. and C. Black; price 3s. 6d.

## DISEASES OF HORSES.

Nature, symptoms, post-mortem appearances, causes, treatment, and prevention; accidents; construction and management of stables; shoeing. Text-books—"Manual of Veterinary Science," by the late William Dick; A. and C. Black. Percivall's "Hippopathology," 4 vols.; price L.4, 5s. 6d. Williams' "Principles and Practice of Veterinary Surgery," MacLachlan & Stewart, Edinburgh; L.1, 10s.

## DISEASES OF CATTLE, SHEEP, DOGS, AND SWINE.

Nature, symptoms, post-mortem appearances; remedial and preventive treatment; dieting and general management of domestic animals. Text-books—Youatt on "Cattle, Sheep, Pigs, and Dogs," Blaine's "Principles of Veterinary Art," Gamgee's "Domesticated Animals in Health and Disease," Fullarton & Co., Edinburgh.

## PRACTICAL EXAMINATION

Will include diagnosis, orally and in writing, of cases of lameness and diseases of horses. Examination of horses as to soundness. Surgical and other operations performed on veterinary patients. Examination, chiefly of morbid specimens, mostly conducted at the abattoirs.

## CERTIFICATES IN FORESTRY.

The Society grants FIRST and SECOND CLASS CERTIFICATES in FORESTRY.

### BOARD OF EXAMINERS.

1. *Science of Forestry and Practical Management of Woods*.—Dr CLEGHORN, Stravithy, St Andrews; JOHN MACGREGOR, Ladywell, Dunkeld; WILLIAM M'CORQUODALE, Scone Palace, Perth; J. GRANT THOMSON, Grantown, Strathspey.
2. *Elements of Botany*.—Professor BALFOUR, Edinburgh.
3. *Nature and Properties of Soils, Drainage, and Effects of Climate*.—Professor WILSON, Edinburgh.
4. *Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to Fencing, Drainage, Bridging, and Road-Making; Implements of Forestry*.—A. W. BELFRAGE, C.E., Edinburgh.
5. *Book-keeping and Accounts*.—KENNETH MACKENZIE, C.A., Edinburgh.

Candidates must possess—1st, A thorough acquaintance with the details of practical forestry. 2d, A general knowledge of the following branches of study, so far as these apply to Forestry:—The Outlines of Botany; the Nature and Properties of Soils, Drainage and Effects of Climate; Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to fencing, draining, bridging, and road-making; Implements of Forestry; Book-keeping and Accounts. The Examinations are open to Candidates of any age.

\* The following have passed for First-Class Certificate:—

1. <i>C. F. Bligh, England,</i>	1870
2. GEORGE YOUNG WALL, M.R.A.C., Durham,	1870
3. WILLIAM BAILLIE, Forester, Whittingham, East Lothian,	1871
4. WILLIAM ROBERTSON, Forester's House, Lauder,	1871
5. PETER LONEY, Marchmont, Dunse,	1873

## SYLLABUS OF EXAMINATION.

### I.—SCIENCE OF FORESTRY AND PRACTICAL MANAGEMENT OF WOODS.

1. Formation and ripening of Wood. Predisposing causes of decay. 2. Restoration of Wood-lands:—(1.) Natural reproduction; (2.) Artificial planting. 3. General management of plantations. Cropping by rotation. Trees recommended for different situations. 4. Season and methods of pruning, thinning, and felling. 5. Circumstances unfavourable to the growth of trees. 6. Mechanical appliances for conveying and converting timber. Construction of saw-mills. 7. Qualities and uses of chief indigenous timbers. Processes of preserving timber. 8. Management of nurseries. Seed-sowing. 9. Collection of forest produce. 10. Manufacture of tar and charcoal. 11. Insects injurious to trees—preservation of birds which prey upon them, drawing a distinction between birds which are beneficial and those which are destructive to trees.

\* Names of those deceased, so far as known, are printed in italics.

## II.—ELEMENTS OF BOTANY.

1. Nutritive Organs of plants.—Root, stem, leaves. Functions of roots. Various kinds of stems, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves. 2. Reproductive Organs.—Flower and its parts. Arrangement of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed or germination. 3. General Principles of Classification.—Meaning of the terms Class, Order, Genus, Species. Illustrations taken from common forest trees and shrubs. Practical Examination on fresh specimens and models; some of the latter may be seen in the Museum at the Royal Botanic Garden, which is open daily to the public free. Candidates may consult Professor Balfour's "Elements of Botany," published by A. & C. Black, Edinburgh, 1869. Price 3s. 6d.

## III.—NATURE AND PROPERTIES OF SOILS, DRAINAGE AND EFFECTS OF CLIMATE.

1. The different descriptions of soils, their classification, and suitability to growth of different descriptions of timber trees. 2. The composition and constituents of soils. The relations between the soil and trees growing on it. 3. The effects of drainage on soils and on climate. 4. The mode of drainage for plantations. 5. The influence of temperature, rainfall, aspect, shelter, and prevailing winds on tree life. 6. The methods of registering and recording observations, and the instruments used.

## IV.—LAND AND TIMBER MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, BRIDGING, AND ROAD-MAKING; IMPLEMENTS OF FORESTRY.

1. The use of the Level and Measuring Chain. Measuring and mapping surface areas. 2. The measurement of solid bodies—as timber, stacked bark, faggots, &c., earthwork. 3. The different modes of fencing and enclosing plantations; their relative advantages, durability, cost of construction, and repairs. 4. The setting out and formation of roads for temporary or permanent use. 5. The construction of bridges over streams and gullies; of gates or other entrances. 6. The different implements and tools used in planting, pruning, felling, barking, and working up timber trees, or preparing them for sale. Ewart's "Agricultural Assistant," Blackie & Son, Glasgow and Edinburgh; price 3s. 6d. Strachan's "Agricultural Tables," Oliver & Boyd, Edinburgh; price 2s. 6d.

## V.—BOOK-KEEPING AND ACCOUNTS.

1. Questions in practice and proportion. 2. Book-keeping—describe books to be kept: give examples. Taking of stock.

## CHEMICAL DEPARTMENT.

(*This department is under reconsideration.*)

*Assistant Chemist.*—Mr JAMES DEWAR, The Laboratory, Veterinary College, Edinburgh.

The objects of the Chemical Department are fourfold :—

- I. The prosecution of researches in various subjects connected with Agricultural Chemistry, the results of which are published at intervals in the Transactions.

The Chemist will be glad at all times to receive suggestions from Members of the Society regarding subjects they may consider worthy of investigation, and which will be laid before the Chemical Committee.

- II. To assist in the performance of minute and accurate Field Experiments.

For this purpose it was resolved to institute field experiments on a systematic plan, and in such a manner as to obtain exact and comparable results. These experiments, as now arranged, are to be carried out under the personal superintendence and inspection of the assistant chemist in a limited number of districts, where a local committee of members make application for them and will contribute two-thirds of the expenses incurred. The nature and extent of such experiments to be determined by the Directors. Members who have any suggestions to make regarding subjects deserving investigation are requested to communicate with Mr Dewar.

- III. District Lectures.

Lectures by the assistant chemist will be given in a limited number of districts on application from a local committee of members and on payment of L.2, 2s. for each lecture in addition to travelling expenses. If three lectures be given on consecutive days the fee to be L.5, 5s. for the course.

- IV. The performance of Analyses of Manures, Soils, Vegetable Products, &c., for Members of the Society at reduced fees.

In purchasing manures, cattle foods, &c., Members are recommended, in all cases, to do so by guaranteed analyses, and to ascertain that the article delivered corresponds with it. Partial analyses, such as Nos. 6 and 7 of the accompanying list, will generally suffice to check the correspondence of the stock with the guarantee, and give an *approximate*, though not a precise, estimate of its value. When an *exact* estimate is required, a complete analysis is necessary.

Samples intended for analysis should be sent (carriage paid) addressed to Mr JAMES DEWAR, THE LABORATORY, VETERINARY COLLEGE, EDINBURGH, and when of small size, they are most cheaply and expeditiously forwarded *by post*. They should be distinctly labelled, marked with the name and address of the sender in full, and accompanied by a letter specifying the particular analysis required, according to its number in the following list,—and, if possible, the object in view,—as, by doing so, much trouble and delay will occasionally be saved.

Some inconvenience having been experienced by persons sending samples for analysis which had not been selected with sufficient care, and were afterwards found not to represent the average composition of the substance, it is particularly requested that the following instructions may be attended to as closely as circumstances will permit.



## INSTRUCTIONS FOR SELECTING SAMPLES FOR ANALYSIS.

*Manures.*—A large double handful of the Manure should be taken from each of *at least* five or six different bags; and if any lumps are found in it, a due proportion of these should also be taken. The whole being laid on a large sheet of paper, should be carefully mixed by rubbing with the hand, the lumps being broken down and mixed as uniformly as possible with the powdery part. If this mixture be carefully made, a quantity of it, not exceeding *two ounces*, will suffice for the analysis. It should be folded up in tinfoil to prevent its becoming dry. In default of tinfoil, the sample may be wrapped in double folds of strong writing paper. Should the manure contain stones, or be very moist, or should any difficulty be experienced in making a uniform mixture, it is desirable that *two or three pounds* should be sent.

*Soils.*—In selecting Soils for analysis, five or six spadefuls should be taken from different parts of the field, and after being spread out in a thin layer for several days to dry, should be put two or three times through a fine sieve, so as to ensure uniform mixture. For a complete analysis, not less than *two pounds* should be sent; for a partial analysis, three or four ounces will be sufficient.

*Waters.*—For the complete analysis of a Water, from *two to three gallons* are required; for the determination of the amount of salts in solution, and lime thrown down by boiling, *two quarts* will suffice. A well water may be selected at any time, but the water of a spring or running stream should be taken in dry weather. The jars or bottles in which they are sent must be tightly corked and sealed. In the analysis of a mineral water, it may sometimes be desirable to determine the amount of gases held in solution, in which case certain precautions must be observed which require the presence of a chemist at the spring.

*Limestones, Clays, Ironstones, &c*—If the bed of any of these substances of which the analysis is required be very uniform in appearance, a piece of two or three ounces weight taken from any part of it will be enough for analysis; but in all cases it is better to send three or four chips from different parts of its thickness. Sometimes, where the character of different parts of the bed vary much, separate analysis of these portions may be requisite, in which case two ounces of each may be sent.

The following are the rates at which analyses, &c., are furnished to *Members of the Society*, and it is requested that the fee be remitted along with the sample:—

1. Complete analysis of a Soil, including determination of Alkalies and Phosphates, L.3.
2. A partial analysis of a Soil, such as the determination of the quantity of Organic Matter, and relative proportion of Clay, Sand, and Carbonate of Lime it contains, 10s.
3. Quantitative determination of any one ingredient of a Soil, 7s. 6d.
4. Complete analysis of Saline Manures and other substances, such as Gypsum, Nitrates of Soda and Potash, Ammoniacal Salts, Guano, Oil-cake, Bone-dust, Rape-dust, Superphosphate of Lime, L.1.
5. Testing the above substances for adulterations—for each sample, 5s.

This examination is generally sufficient to determine whether or not any of these substances are grossly adulterated, but it gives no idea of the comparative value of different Samples, where all are genuine.

6. Determination of the percentage of Phosphates and Ammonia in a Guano, 10s.
7. Determining the Quality of Soluble and Insoluble Phosphates in a Superphosphate, 10s.

This and the preceding determination generally suffice to show

whether the sample is of fair quality, and corresponds with the analysis by which it was sold, but not to fix its exact commercial value.

8. Complete analysis of Limestone, Marl, Shell-Sand, &c., L.1.
9. Examining any of the above substances for the quantity of Lime, and ascertaining in the same the presence of Magnesia and Alumina, 7s. 6d.  
Ascertaining the proportion of these, 2s. 6d. additional for each substance.
10. Complete analysis of the Ash of any Plant, L.3.
11. Complete analysis of a Water, L.2.
12. Determination of the Amount of Salts in Solution, and of the Lime thrown down by boiling in any water, 10s.
13. Analysis of Tile or Fire Clay, L.1, 10s.
14. Complete analysis of Roots, Grains, or other Vegetable Products, L.1.
15. Examining products of Vegetation, or of the Dairy, such as Nutritive Matters in Wheat, or other Grain—quantity of Butter or Cheese in Milk—5s. for each ingredient.
16. Determination of the quantity of Nitrogen in any substance, 7s. 6d.
17. Answers to letters asking advice on subjects within the department of the chemist, 5s.

The charges for other Analyses not specified in the list will be settled by the Committee of Management, with reference to the amount of work which they involve, and on a scale similar to the above.

## P R E M I U M S.

### GENERAL REGULATIONS FOR COMPETITORS.

All Reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter similarly marked, containing the name and address of the Reporter—initials must not be used.

No sealed letter, unless belonging to a Report found entitled to at least one-half of the Premium offered, will be opened without the author's consent.

Reports, for which a Premium, or one-half of it, has been awarded, become the property of the Society, and cannot be published, in whole or in part, nor circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors, if applied for within twelve months.

When a Report is unsatisfactory, the Society is not bound to award the whole or any part of a Premium.

All Reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded. Weights and measurements must be indicated by the imperial standards.

The Directors, before awarding a Premium, shall have power to require the writer of any Report to verify the statements made in it.

The decisions of the Board of Directors are final and conclusive as to all Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

Reports on subjects not included in the Premium List will be received, and honorary rewards will be given when merited.

## CLASS I.

### R E P O R T S.

#### SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

##### FOR APPROVED REPORTS.

1. Best Text-Book on Agriculture as a Branch of Physical Science, including the application of Botany, Geology, Chemistry, and Animal Physiology—Amount of Premium according to merit. To be lodged by 1st November 1875.

2. On the Agriculture of the Counties of Edinburgh and Linlithgow, and the industrial progress and development of these Counties during recent years—Thirty Sovereigns. To be lodged by 1st November 1875.

The Report should embrace full details of the different systems of Farm Management observed in the Counties, and of the progress which Agriculture and other industries have made within the last 25 years.

3. On the Agriculture of the County of Fife—Thirty Sovereigns. To be lodged by 1st November 1875.

The Report should embrace full details of the different systems of Farm Management observed in the County, and of the progress which Agriculture and other industries have made within the last 25 years.

4. On the Agriculture of the Counties of Ross and Cromarty—Thirty Sovereigns. To be lodged by 1st November 1876.

The Report should embrace full details of the different systems of Farm Management observed in the Counties, and of the progress which Agriculture has made within the last 25 years.

5. On the comparative advantages in Scotland of Ploughing in Manure in autumn or winter immediately after it is spread on the land, or of allowing it to remain on the ground for some weeks before it is covered—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1875.

6. On the results of experiments for ascertaining the comparative value of farm-yard Manure, obtained from cattle fed upon different varieties of food, by the application of such manures to farm crops—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must state the effects produced on two successive crops by the application of manure obtained from cattle fed on different sorts of food, such as turnips and straw alone; and turnips and straw, with an addition of oil-cake, linseed, bean-meal, grain, or other substances. The animals should be as nearly as possible of the same age, weight, condition, and maturity, and each lot should receive daily the same quantity of litter; and, except as to the difference of food, they must be treated alike.

The preparation of the manure, by fermentation or otherwise, should be in every respect the same; and it is desirable that not less than two several experiments be made with each kind, and that the ground to which it is to be applied be as equal as possible in quality and condition.

7. On the comparative value of Manure made in the ordinary manner, and of Manure kept under cover till applied to the Land—Twenty Sovereigns. To be lodged by 1st November in any year.

The experiment may be conducted either with manure made in the open straw-yard, contrasted with that made in covered hammels or boxes, or with manure made in feeding houses, part of which shall have been placed under cover, and part removed to the open dung-pit, and kept carefully unmixed with any other manure. Preference will be given to experiments embracing both of these modes. The cattle must be fed and littered alike. There must be at least an acre of land experimented on with each sort of manure—the different lots must be manured to the same extent, and be equal in soil, and the crops must be accurately weighed and measured on two separate portions of each lot, not less than 20 poles. The result, as given by two successive crops, to be reported.

8. On the means successfully employed for obtaining new Agricultural Plants or new and superior varieties, or improved sub-varieties, of any of the cereal grains, grasses, roots, or other agricultural plants at present cultivated in this country—Medals or Sums of Money not exceeding L.50. To be lodged by 1st November 1875.

It is necessary that the varieties and sub-varieties reported upon shall have been proved capable of reproduction from seed, and also that the relation they bear to others, or well-known sorts, should be stated. The reporter is further requested to mention the effects that he may have observed produced by different soils, manures, &c., on the plants forming the subjects of report, and how far he may have ascertained such effects to be lasting.

Should any improved variety reported upon be the result of direct experiment by cross impregnation, involving expense and long-continued attention, a higher premium will be awarded.

9. On the cultivation of the Cabbage as a field crop—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1875.

The experiment must be conducted on not less than one acre, and contrasted with a like extent under turnips in the same field. Both lots must have been under one rotation, and must be prepared and manured in the same manner.

10. On the Insects which prey upon Agricultural Plants, and the diseases occasioned by them, and the best means of prevention—Twenty Sovereigns. To be lodged by 1st November 1875.

11. On the hardy and useful Herbaceous Plants of any country where such climate exists, as to induce the belief that the plants may be beneficially introduced into the cultivation of Scotland—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Attention is particularly directed to the Grains and Grasses of China, Japan, the Islands of the Eastern Archipelago, the Himalaya country, the Falkland and South Sea Islands, California, and the high north-western districts of America.

Reporters are required to give the generic and specific names of the plants treated of, with the authority for the same—together with the native names, so far as known; and to state the elevation of the locality and nature of the soil in which they are cultivated, or which they naturally inhabit, with their qualities or uses; and it is further requested that the descriptions be accompanied, in as far as possible, with specimens of the plants, and their fruit, seed, or other products.

12. On the comparative advantages of fattening Cattle in stalls, in loose houses or boxes, and in sheds or hammels—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must detail the comparative result of actual experiments.

The same quantities and kinds of food must be used. Information is required as to the comparative expense of attendance, the cost of erecting the buildings, and any other circumstances deserving of attention. The state of the weather during the experiment, in point of temperature and wetness, must be particularly noted and reported.\*

13. On experiments for ascertaining the actual addition of weight to growing or fattening Stock, by the use of different kinds of food—Twenty Sovereigns. To be lodged by 1st November in any year.

The attention of the experimenter is directed to turnips, carrots, beet, mangold wurzel, potatoes, cabbage, as well as to beans, oats, barley, Indian corn, linseed, oil-cake or rape-cake, and to the effect of warmth and proper ventilation, and the difference between food cooked and raw. The above roots and other kinds of food are merely suggested; competitors are neither restricted to them nor obliged to experiment on all of them.

When experiments are made with linseed and cake, attention should be paid to the comparative advantages, economically and otherwise, of the substances in these two states.

Before commencing the comparative experiments, the animals must be fed alike for some time previously.

The progress of different breeds may be compared. This will form an interesting experiment of itself, for reports of which encouragement will be given.\*

- \* The experiments specified in Nos. 12 and 13 must be conducted over a period of not less than three months. No lot shall consist of fewer than four Cattle or ten Sheep. The animals selected should be of the same age, sex, and breed, and, as nearly as possible, of the same weight, condition, and maturity. The live weight before and after the experiment must be stated, and, if killed, their dead weight and quantity of tallow.

14. On the Ayrshire Breed of Cattle, and the means that have been or might be used for its improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1875.

15. On the causes of the Septic, Anthrax, or Carbuncular Fevers which prevail in Great Britain amongst Horses, Cattle, Sheep, and Pigs—Fifteen Sovereigns. To be lodged by 1st November 1875.

The Report must state the causes which induce them, having particular reference to the influences of diet, heat, cold, moisture, drainage, ventilation, &c., as well as to the soil upon which they are most commonly found; also whether they are contagious or in any way capable of propagation from one animal to another, not only of the same but of a different species; if the flesh of cattle, sheep, and pigs slaughtered in any stage of the disease is fit for human food; and, finally, to draw a comparison between the maladies and any forms of disease affecting the human race.

16. On Inoculation as a means for the prevention of Pleuro-Pneumonia—Ten Sovereigns. To be lodged by 1st November 1875.

Reference to be made to the method of performing the operation—the selection of the proper virus—and its effects on the animal's system. The Report must also state the results of the writer's own experience, and give references to various experimentalists and authorities who have written on the subject.

17. On the comparative return from Capital invested in Cropping, Grazing, or Planting land upon hill and moorland—Twenty Sovereigns. To be lodged by 1st November 1875.

The subject to have reference not only to immediate return upon capital expended, but also to be considered in relation to the amelioration of the soil, climate, and prospective enhancement of value thereby.

18. On the management of the best Pasture Districts in England, and how far such management is applicable to Scotland—Twenty Sovereigns. To be lodged by 1st November 1875.

The Report should state the nature of the soil and subsoil—the condition of the land as regards drainage, the rotation of crops and system of management of the lands previous to being sown with grass seeds; the cultivation necessary before sowing out to grass, and whether the grass seeds should be sown with a corn crop or without; the quantities and kinds of grass and clover seeds sown; the locality in which the land is situated; the average rain-fall and temperature of the district; the letting value of the land while under a rotation of crops, and its letting value as pasture after being five years in grass.

19. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purpose chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

## SECTION 2.—ESTATE IMPROVEMENTS.

### FOR APPROVED REPORTS.

1. By a Proprietor or Tenant in Scotland on the cultivation of not less than 150 imperial acres of land of inferior quality—First Premium, L.200; Second, L.150. Intimation of intention to compete to be lodged by 1st November 1875.

The operations to be reported on must be commenced not later than the autumn of 1875—be conducted on a farm of at least 150 acres imperial—extend over a period of not less than 3 or 6 years—and embrace a complete rotation of crops.

The Society will appoint a Committee, who shall determine if the land is of the class referred to. The Committee shall periodically inspect the operations, and shall have power to call for information on any point they may consider necessary. They shall not in any way interfere with the system of management pursued, nor make any suggestions, but shall take their own notes, so as to be able to check the statements made in the Report.

The Report must detail the previous state of the land and the system of cultivation pursued thereon, if any—the nature of the soil and sub-soil—the whole operations carried on, including trenching, draining, liming, fencing, road-making, &c., during the rotation, and the cost thereof—the quantity and cost of all seed and manure applied—the produce of each crop—and the kind and quantity of live stock kept. Classified abstracts of the whole expenditure and return for each year must also be given.



2. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Medium Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the reporter's proprietorship.

3. By the Proprietor in Scotland who shall have erected on his estate the most approved Farm-buildings—The Gold Medal. Reports, Plans, and Specifications to be lodged by the 1st November in any year.

4. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty acres of waste land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

5. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of waste land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year,

6. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Reports in competition for Nos. 4, 5, and 6 may comprehend such general observations on the improvement of waste lands as the writer's experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of a profitable character, and a rotation of crops must have been concluded before the date of the report. *A detailed statement of the expenditure and return*, and a certified measurement of the ground, are requisite.

7. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

8. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 7 and 8 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

### SECTION 3.—MACHINERY.

#### FOR APPROVED REPORTS.

1. On such inventions or improvements, by the reporters, of any implement or machine as shall be deemed by the Society of public utility—Medal, or sums of money not exceeding Fifty Sovereigns. To be lodged at any time.

Reports should be accompanied, by drawings and descriptions of the implement or machine, and, if necessary, by a model.

2. On a machine for cutting or condensing turf or peat by steam or horse power—Twenty Sovereigns. To be lodged by 1st November 1875.

3. On the best and most approved Cattle Truck for feeding and watering the animals in transit—Twenty Sovereigns. To be lodged by 1st November 1875.

Reports must be accompanied with drawings and descriptions, or, if necessary, by a model.

### SECTION 4.—FORESTRY DEPARTMENT.

#### FOR APPROVED REPORTS.

1. By a Proprietor in Scotland who shall, within the five preceding years, have planted not less than 150 acres—The Gold Medal. To be lodged by 1st November in any year.

The whole planting operations which may have been conducted by the reporter within the five years, whether completed or not, must be embraced, and he must state the expense—description of soils—age, kind, and number of trees planted per acre—mode of planting, draining, and fencing—general state of the plantation—and any other observations of interest.

2. By a Practical Forester, of the management of Plantations from the commencement of the first thinning till the period of yielding full-grown timber—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

The Report must embrace the following points:—The progress of the different sorts of trees—the effects of altitude and exposure—the general advantages of shelter—the mode of thinning and pruning

adopted—the uses and value of the thinnings—the plan of registry and of valuing, or a specimen of the method in which the forester's book is kept—the valuation at the time of the report—together with such general remarks as may be thought useful.

The Report is not expected to embrace the formation and early management, farther than the description of soil, kinds of plants, whether mixed or in masses, together with a note of the expense from the time of planting to the commencement of the first thinning, in so far as such information is in the possession of the reporter.

3. On Plantations, of not less than eight years' standing formed on deep peat bog—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1875.

The Premium is strictly applicable to deep peat or flow moss; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subsiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and number of trees planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

4. On the more extended introduction of hardy, useful, or ornamental Trees, which have not hitherto been generally cultivated in Scotland—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Report should specify as distinctly as possible the kind of trees introduced. The adaptation of the trees for use or ornament, and their comparative progress should be mentioned. Attention is directed to the introduction of any tree as a nurse in young plantations, which by growing rapidly for several years, and attaining maturity when at the height of 20 or 25 feet, might realise the advantages and avoid the evils of thick planting.

5. On the value, for economical purposes, of the Corsican Fir, and on its adaptation to different soils and situations—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The reporter's observations must go beyond the limited knowledge of this tree as hitherto grown in Britain, and must embrace its nature, uses, and adaptations in those countries of which it is a native.

6. On the *Pinus Pinaster*, or Cluster Pine—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1875.

The Report must state the extent of ground planted in any particular locality, age and size of trees, also the value and duration of its timber as compared with others of the fir tribe.

7 On the effects produced on the various species of Trees and Shrubs by smoke from public works—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1875.

8. On the more extended cultivation in Scotland of charcoal-producing Plants, for gunpowder or commercial purposes—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1875.

Reference to be made to suitable varieties of plants not generally grown in this country for that purpose, such as *Rhamnus Frangula*, prices realisable, and suggestions for their more general introduction, treatment, &c.

9. On the woods, forests, and forestry in the county of Perth—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1875.

10. On the woods, forests, and forestry in the county of Ross—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1875.

11. On the utilisation of waste produce of Forests and Woodlands as matter for making, either separately or in combination with other substances, an artificial fuel—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November 1875.

## CLASS II.

### DISTRICT COMPETITIONS.

*The Money Premiums and Medals awarded at District Competitions will be issued in January next. No Payments must, therefore, be made by the Secretary or Treasurer of any local Association.*

*Grants in Aid of DISTRICT COMPETITIONS for 1876 must be applied for before 1st NOVEMBER next.*

*When a Grant has expired, the District cannot apply again for aid for two years.*

### SECTION 1.—CATTLE.

*Note.*—The Society's Cattle Premiums are granted to each District for three alternate years, on condition that the District shall, in the two intermediate years, continue the Competitions by offering for the same description of stock a sum not less than one-half of that given by the Society.

At the intermediate Competitions, a Silver Medal will be placed at the disposal of the Committee, to be awarded for the best Bull belonging to a Proprietor, and of the class for which the District receives Premiums; also three Medium Silver Medals to be given along with the first prize in the three Classes of Cattle, provided there are not fewer than two lots exhibited in each class.

The selection of the Breed is left to the Local Committee. See Rule 6.

#### DISTRICTS.

1. VALE OF ALFORD.—*Convener*, R. O. Farquharson of Haughton, Alford; *Secretary*, G. Wilken, Waterside of Forbes, Aberdeenshire.
2. DISTRICT OF SPEY, AVON, AND FIDDOCHSIDE.—*Convener*, Sir George Macpherson Grant of Ballindalloch, Bart.; *Secretary*, William Robertson, Burnside, Ballindalloch.
3. ISLAND OF SKYE.—*Convener*,  
*Secretary*, Alex. Macdonald, Portree.
4. COUNTY OF ELGIN.—*Convener*, Robert Grant of Kincorth, Forbes; *Joint-Secretaries*, William Macdonald, Elgin, and John Ferguson, East Grange, Forbes.
5. DISTRICT OF STRATHBOGIE.—*Convener*, Robert Simpson of Cobairdy, Huntly; *Secretary*, William Murdoch, Huntly.
6. DISTRICT OF THE UNITED BANFFSHIRE SOCIETY.—*Convener*, W. J. Tayler of Glenbarry, Rothiemay House, Huntly; *Secretary*, George Cumming, Banff.
7. COUNTY OF STIRLING.—*Convener*, Sir Alexander C. R. Gibson Maitland of Clifton Hall, Bart.; *Secretary*, Robert Taylor, 49 King Street, Stirling.

8. COUNTY OF KINCARDINE.—*Convener*, Sir Thomas Gladstone of Fasque, Bart., Laurencekirk; *Secretary*, James B. Greig, Laurencekirk.
9. DISTRICT OF GARIOCH.—*Convener*, William Leslie of Warthull, Pitcaple; *Secretary*, William Home, Westerton of Pitmedden, Insh.
10. DISTRICTS OF LORN AND NETHER LORN.—*Convener*, James Bett, Easdale; *Secretary*, Angus Whyte, Easdale, Oban.
11. DISTRICT OF ARGYLE.—*Convener*, Captain Orde, yr. of Kilmory, Auchnaba, Lochgilphead; *Secretary*, William Hopewell, Rashe Cottage, Kilmartin.
12. COUNTY OF RENFREW.—*Convener*, Colonel Campbell of Blythwood; *Secretary*, R. L. Henderson, Paisley.
13. DISTRICT OF EAST KILBRIDE.—*Convener*, William Forrest of Lawmuir, Allanton, Hamilton; *Secretary*, William Hay, East Kilbride.

### PREMIUMS.

1. Best Bull. of any pure breed, belonging to a Proprietor, The Silver Medal.
2. Best Bull. of any pure breed, calved before 1st January 1873  
Medium Silver Medal and L 4  
Second best, . . . . . L 3  
Third best, . . . . . L 1
3. Best Bull. of any pure breed, calved after 1st January 1873  
Medium Silver Medal and L 3  
Second best, . . . . . L 2  
Third best, . . . . . L 1
4. Best 2-year-old Heifer (if Highland breed, 3 years), of any pure breed,  
Medium Silver Medal and L 3  
Second best, . . . . . L 2  
Third best, . . . . . L 1

### In 1875.

Nos. 1, 2, and 3 are in competition for the last year.

No. 4, for the second.

Nos. 5 and 6, for the first year.

Nos. 7, 8, and 9 compete for local Premiums.

Nos. 10, 11, 12, and 13 are in abeyance on account of the Glasgow Show.

## SECTION 2.—HORSES

### FOR AGRICULTURAL PURPOSES.

*Note*—The Society's Stallion Premiums are granted to each District for two years, and are followed by Premiums for other two years for Brood Mares, and again for a similar period by Premiums for Entire Colts and Fillies.

#### 1. STALLIONS.

1. DISTRICT OF EASTER ROSS.—*Convener*, Kenneth Murray of Geames, Fearn; *Secretary*, John Douglas, Calrossie, Nigg, Ross-shire.
2. WESTERN DISTRICT OF FIFESHIRE.—*Convener*, Robert Husband, Gellet, Dunfermline; *Secretary*, James M'Farlane, Dunfermline.
3. DISTRICT OF STRATHENDRICK.—*Convener*, C. H. H. Wilcove of Dalnair, Endrick Bank, Drymen; *Secretary*, James Murray, Catter House, Drymen.
4. DISTRICT OF THE ROYAL NORTHERN SOCIETY.—*Convener*, Colonel Innes of Learner, Torphins; *Secretary*, Alexander Yeats, Secretary, Royal Northern Society, Aberdeen.

5. DISTRICT OF THE DALBEATTIE SOCIETY.—*Convener*, W. H. Maxwell of Munches, Dalbeattie; *Secretary*, James Grieve, Dalbeattie.
6. RHINS DISTRICT OF WIGTOWNSHIRE.—*Convener*, R. Vans Agnew of Barnbarroch, M.P.; *Secretary*, Hugh Adair, Stranraer.

Best Stallion, not under 3 years, and not above 12 years old, . . . L.25

In 1875.

Nos. 1, 2, and 3 are in competition for the last year.  
Nos. 4, 5, and 6 for the first year.

2. MARES.

1. DISTRICT OF THE BLACK ISLE.—*Convener*, James Fletcher of Rosehaugh, Avoch; *Secretary*, James R. Mitchell, Drynie, Inverness.
2. DISTRICT OF BUCHAN.—*Convener*, Lieutenant-Colonel Ferguson of Pitfour, Mintlaw; *Secretary*, John Ferguson, Brae of Cornach, Mintlaw.
3. COUNTY OF KINROSS.—*Convener*, Harry Young of Cleish Castle, Kinross; *Secretary*, James Beveridge of Balado, Kinross.
4. DISTRICT OF SELKIRK AND GALASHIELS.—*Convener*, Allan Elliott Lockhart of Borthwickbrae, Hawick; *Secretary*, James Smail, Commercial Bank, Galashiels.
5. COUNTY OF CAITHNESS.—*Convener*, Alexander Henderson of Stemster, Hawick Road, Golspie; *Joint-Secretaries*, James Brims, Writer, Thurso; and James Purves, Lochend, Dunnet.

1. Best Brood Mare, . . . . . Medium Silver Medal and L.4
2. Second best, . . . . . L.3
3. Third best, . . . . . L.1

In 1875.

Nos. 1, 2, and 3 are in competition for the last year.  
Nos. 4 and 5, for the first year.

3. ENTIRE COLTS AND FILLIES.

1. COUNTY OF HADDINGTON.—*Convener*, The Right Hon. R. C. Nisbet Hamilton; *Secretaries*, Richardson & Gemmell, Haddington.
2. COUNTY OF INVERNESS.—*Convener*, Aeneas W. Mackintosh of Raigmore, Inverness; *Secretary*, Hugh Fraser, Balloch of Culloden, Inverness.
3. ISLAND OF SKYE.—*Convener*,  
*Secretary*, Alexander Macdonald, Portree.

1. Best Entire Colt, foaled after 1st January 1873,  
Medium Silver Medal and L.3  
Second best, . . . . . L.2  
Third best, . . . . . L.1
2. Best Entire Colt, foaled after 1st January 1874,  
Medium Silver Medal and L.2  
Second best, . . . . . L.1  
Third best, . . . . . 10s.
3. Best Filly, foaled after 1st January 1873, Medium Silver Medal and L.3  
Second best, . . . . . L.2  
Third best, . . . . . L.1
4. Best Filly, foaled after 1st January 1874, Medium Silver Medal and L.2  
Second best, . . . . . L.1  
Third best, . . . . . 10s.

In 1875.

No. 1 is in competition for the last year.

Nos. 2 and 3 for the first year.

### SECTION 3.—SHEEP.

*Note.*—The Society's Sheep Premiums are granted to each District for three alternate years, on condition that the District shall, in the two intermediate years, continue the Competitions by offering for the same description of stock a sum not less than one-half of that given by the Society. At the intermediate Competitions, a Silver Medal will be placed at the disposal of the Committee, to be awarded for the best Tup belonging to a proprietor, and of the class for which the District receives Premiums; also four Medium Silver Medals, to be given along with the first prize in the four classes of Sheep, provided there are not less than two lots in each class.

The selection of the Breed is left to the Local Committee. See Rule 6.

#### DISTRICTS.

1. DISTRICT OF ANNANDALE, INCLUDING PARISH OF KIRKMICHAEL.—*Convener*, J. J. Hope Johnstone of Annandale, Raehills, Lockerbie; *Secretary*, Christopher Johnstone, Dinwoodie Lodge, Lockerbie.
2. DISTRICT OF THE BORDER UNION SOCIETY.—*Convener*, John Ord of Muirhouse-law, Nisbet, Kelso; *Secretary*, William Jerdan, Kelso.
3. COUNTY OF SELKIRK.—*Convener*, A. Elliott Lockhart of Borthwickbrae, Hawick; *Secretary*, Peter Rodger, Selkirk.
4. DISTRICT OF THE BADENOCH AND ROTHMURCHUS SOCIETY.—*Convener*, Cluny Macpherson, Cluny Castle, Kingussie; *Secretary*, Donald Stewart, Chapelpark, Kingussie.
5. COUNTY OF SUTHERLAND.—George Loch of Embo, Q.C.; *Secretary*, William Mitchell, Pulrossie, Dornoch.
6. DISTRICT OF THE WEST LINTON SOCIETY.—*Convener*, A. P. Hope, yr. of Bordlands, Lamancha; *Secretary*, A. Alexander, West Linton.
7. WEST LOTHIAN AND THE EASTERN DISTRICT OF STIRLINGSHIRE.—*Convener*, Sir William Baillie of Polkemmet, Bart., Whitburn; *Secretary*, George Wilson, Loch House, Linlithgow.
8. COUNTY OF FORFAR.—*Convener*, The Earl of Strathmore, Glamis Castle, Glamis; *Secretary*, J. L. Gordon, Swan Street, Brechin.
9. DISTRICT OF WEST TEVIOTDALE.—*Convener*, W. Scott Watson of Burnhead, Bucklands, Hawick; *Secretary*, James Oliver of Thornwood, Hawick.
10. DISTRICT OF BREADALBANE.—*Convener*, The Earl of Breadalbane, Taymouth Castle, Aberfeldy; *Secretary*, John Holmes, Bolfracks, Aberfeldy.
11. UPPER WARD OF LANARKSHIRE.—*Convener*, John Ord Mackenzie of Dolphinton; *Secretary*, David Oswald, Abington.
12. ISLANDS OF MULL, COLL, AND TYREE.—*Convener*, Farquhar Campbell of Rum; *Secretary*, David Thorburn, Calgary, Tobermory.
13. DISTRICT OF COWAL.—*Convener*, Alex. S. Finlay of Castle Toward, Greenock; *Secretary*, Archibald Mitchell, jun., Dunoon.

- |  |                             |
|--|-----------------------------|
| 1. Best Tup belonging to a Proprietor, | The Silver Medal.           |
| 2. Best Tup above one Shear,           | Medium Silver Medal and L.3 |
| Second best,                           | L.1                         |
| Third best,                            | 10s.                        |



- |                                      |           |                             |
|--------------------------------------|-----------|-----------------------------|
| 3. Best Shearling Tup.               | . . . . . | Medium Silver Medal and L.3 |
| Second best,                         | . . . . . | L.1                         |
| Third best,                          | . . . . . | 10s.                        |
| 4. Best 5 Ewes, above one Shear,     | . . . . . | Medium Silver Medal and L.3 |
| Second best,                         | . . . . . | L.1                         |
| Third best,                          | . . . . . | 10s.                        |
| 5. Best 5 Gimmers or Shearling Ewes, | . . . . . | Medium Silver Medal and L.3 |
| Second best,                         | . . . . . | L.1                         |
| Third best,                          | . . . . . | 10s.                        |

In 1875.

Nos. 1, 2, and 3 are in competition for the last year.

Nos. 4, 5, and 6, for the first year.

Nos. 7, 8, 9, and 10 compete for local Premiums.

Nos. 11, 12, and 13 are in abeyance on account of the Glasgow Show.

#### SECTION 4.—SWINE.

The Society's Swine Premiums are given for three consecutive years.

- |   |           |                             |
|---|-----------|-----------------------------|
| 1. Best Boar belonging to a Proprietor, | . . . . . | The Silver Medal.           |
| 2. Best Boar,                           | . . . . . | Medium Silver Medal and L.3 |
| Second best,                            | . . . . . | L.1                         |
| Third best,                             | . . . . . | 10s.                        |
| 3. Best Brood Sow,                      | . . . . . | Medium Silver Medal and L.2 |
| Second best,                            | . . . . . | L.1                         |
| Third best,                             | . . . . . | 10s.                        |

In 1875.

No application has been received.

#### SECTION 5.—DAIRY PRODUCE.

The Society's Dairy Premiums are given for three consecutive years.

- |   |           |                             |
|---|-----------|-----------------------------|
| 1. Best Couple of Sweet Milk Cheeses belonging to a Proprietor,         | . . . . . | The Silver Medal.           |
| 2. Best Couple of Sweet Milk Cheeses,                                   | . . . . . | Medium Silver Medal and L.2 |
| Second best,  | . . . . . | L.1                         |
| Third best,   | . . . . . | 10s.                        |
| 3. Best Cured Butter (not less than 14 lbs.) belonging to a Proprietor. | . . . . . | The Silver Medal.           |
| 4. Best Cured Butter (not less than 14 lbs.),                           | . . . . . | Medium Silver Medal and L.2 |
| Second best,  | . . . . . | L.1                         |
| Third best,   | . . . . . | 10s.                        |

In 1875.

No application has been received.

#### RULES OF COMPETITION.

1. The Members of the Society connected with the respective Districts are appointed Committees for arranging the Competitions; five members to be a quorum.

2. The Convener of each District shall summon a meeting of Committee for the purpose of determining the time and place of Competition, the nomination of Judges, and other preliminary arrangements. The time and place (which must be within the bounds of the District, unless in reference to Stallions special permission has been obtained to the contrary), shall be publicly intimated by Conveners.

3. The Money Premiums awarded at District Competitions will be paid in January next, by precepts issued by the Directors. No payments must, therefore, be made by the Secretary or Treasurer of any local Association.

4. Stock must be the property of the Exhibitor at the date of Entry. *No entry shall be received later than one week previous to the Show.* Entry-Money shall not exceed  $2\frac{1}{2}$  per cent. on the amount of the premium to be competed for.

5. The Competitions (except for Horses) must take place between the 1st of April and the 20th of October, and are open to all parties within the District, whether members of the local Association or not.

6. The Committee shall select the breed, and specify it in the returns. In Cattle, the animals exhibited must belong to one of the following pure breeds—Short-horn, Ayrshire, Polled (Galloway, Angus, or Aberdeen), Highland. The Bulls may be of one breed, and the Heifers of another. In Sheep, the breeds must be Leicester, Cheviot, or Blackfaced.

7. Stock of an inferior description, or which does not fall within the prescribed regulations, shall not be placed for competition.

8. The Premiums shall not be divided. In Cattle, Horses, Sheep, and Swine, four lots in each Class will warrant the award of full, and two lots of half, Premiums. In Dairy Produce, eight Exhibitors in any one Class will warrant an award of full, and four of half, Premiums. A competitor may exhibit two lots in each Class, except in Dairy Produce, where only one lot is allowed from the same farm. For the Silver Medal to Proprietors two lots are required.

9. An animal which has gained the Society's first Premium at a previous District or General Show is inadmissible in the same Class, except in the case of Bulls and Tups for the Medal; and one which has gained a second Money Premium can only thereafter compete in that Class for the first.

10. Proprietors farming the whole of their own lands may compete along with Tenant Farmers. Except in the Class for Stallions, the Money Premiums are restricted to Tenants and Proprietors farming the whole of their own lands.

11. A Tenant or Factor may compete with Proprietors for the Silver Medal with a Bull or a Tup which has gained the first Money Premium at a previous District or General Show. When there is any doubt as to whether a competitor should be ranked as a Proprietor or a Tenant, the point is left to the decision of the local Committee.

12. A Bull the property of two or more Tenants, may compete, although the Exhibitors may not be Joint-Tenants.

13. Bulls for which Money Premiums are awarded may be required to serve in the District at least one season; the rate of service to be fixed by the Committee.

14. Evidence must be produced that the Prize Stallions have had produce.

15. Mares must have foals at their feet (except where death of foal is certified), or be entered as being in foal; in the latter case, payment of the Premiums will be deferred till certificate of birth, which must be within 11 months from the date of the Show.

16. Aged Tups shall have served the usual number of Ewes for at least three weeks during the previous season. All Prize Tups must serve within the district. Ewes and Gimmers must be taken from the Exhibitor's stock bred in the district; and Ewes must have reared Lambs during the season. Fleeces must not be artificially coloured.

17. Should it be proved to the satisfaction of the Committee that an animal has been entered under a false names pedigree, or description, for the purpose of misleading the Committee or Judges as to its qualifications or properties, the case shall be reported to the Directors, and submitted by them to the first General Meeting, in order that the Exhibitor shall be disqualified from again competing at the Society's Shows, and his name, if he be a member, struck from the roll.

18. When an animal has previously been disqualified by the decision of any Agricultural Association in Great Britain or Ireland, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it and the grounds thereof, in his entry, to enable the Committee to judge of its validity.

19. Competitors must certify that the Butter and Cheese exhibited by them are average specimens of the produce of their Dairies in 1875, and that the quantity produced during the season has not been less than 1 cwt. of Butter, or 2 cwt. of Cheese.

20. It is to be distinctly understood that in no instance does any claim lie against the Society for expenses attending a show of stock beyond the amount of the Premiums offered.

21. Blank reports will be furnished to the Conveners and Secretaries of the different districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st of November next*, for the approval of the Directors, against whose decisions there shall be no appeal.

22. A report of the Competition and Premiums awarded at the *intermediate* local shows in the several district for Cattle and Sheep, signed by a member of the Society, must be transmitted to the Secretary *on or before the 1st of November in each year*, otherwise the Society's grants shall terminate.

23. When a grant has expired the district cannot apply again for aid for two years.

### SECTION 6.—SPECIAL GRANTS.

L.50 and Medium Gold Medal to the Edinburgh Christmas Club for 1875.

L.20 to Ayrshire Agricultural Association for 1875, to be competed for at the Dairy Produce Show at Kilmarnock—*Convener*, The Hon. G. R. Vernon, Auchans House, Kilmarnock; *Secretary*, James M'Murtrie, Ayr.

L.20 to Unst Society for three alternate years—*Convener*, D. C. Edmondston, Ordale, Balta Sound, Unst; *Secretary*, D. J. White, Unst, Lerwick. Granted 1871.

L.3 to Rousay Society for three alternate years—*Convener*, Colonel F. W. Traill, Borroughs of Rousay, C.B., Orkney; *Secretary*, John Gibson, Sangskail, Rousay. Granted 1875.

### SECTION 7.—MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

The Society, being anxious to co-operate with local Associations, will give a limited number of Medium Silver Medals annually to Societies not on the list of Cattle or Sheep Premiums, in addition to the Money Premiums awarded in the District, for—

1. Best Bull, Cow, Heifer, or Ox.
2. Best Stallion, Mare, or Gelding.
3. Best Tup, or pen of Ewes or Wethers.
4. Best Boar, Sow, or Pig.

5. Best Coops of Poultry.
6. Best sample of any variety of Wool.
7. Best sample of any variety of Seeds.
8. Best managed Farm.
9. Best managed Green Crop.
10. Best managed Hay Crop.
11. Best managed Dairy.
12. Best Sweet Milk Cheese.
13. Best Cured Butter.
14. Best Collection of Roots.
15. Best kept Fences.
16. Male Farm-Servant who has been longest in the same service, and who has proved himself most efficient in his duties, and to have invariably treated the animals under his charge with kindness.
17. Female Servant in charge of Dairy and Poultry who has been longest in the same service, and who has proved herself most efficient in her duties, and to have invariably treated the animals under her charge with kindness.
18. Best Sheep Shearer.
19. Most expert Hedge Cutter.
20. Most expert Labourer at Draining.
21. Most expert Farm Servant at trial of Reaping Machines.
22. Best Maker of Oat Cakes.

It is left to the local Society to choose out of the foregoing list the classes for which the Medals are to be competed.

The Medals are given for Five consecutive years.

*Aberdeenshire.*

1. AUCHINDOIR, KILDRUMMY, and TOWIE ASSOCIATION.—*Convener*, Carlos Pedro Gordon of Wardhouse, Inch; *Secretary*, William Walker, Ardhuncart, Mossat. 4 Medals. Granted 1873.
2. CROMAR, UPPER DEE AND DONSIDER ASSOCIATION.—*Convener*, Dr Robertson, Indego, Tarland; *Secretary*, William Thomson, Banker, Tarland. 4 Medals. Granted 1872 and 1873.
3. EBRIESIDE ASSOCIATION.—*Convener*, John Leith Ross of Arnage, Ellon; *Secretary*, George Johnston, Overtown, Auchnagatt. 4 Medals. Granted 1871 and 1874.
4. FORMARTINE ASSOCIATION.—*Convener*, Lieut.-Col. Ramsay of Barra, Straloch, Aberdeen; *Secretary*, Alexander Davidson, Mains of Cairnbrogie, Old Meldrum. 2 Medals. Granted 1871.
5. FYVIE ASSOCIATION.—*Convener*, Col. Gordon of Fyvie; *Secretary*, James Ironside, Burnside, Fyvie. 2 Medals. Granted 1872.
6. INSCH HORTICULTURAL SOCIETY.—*Convener*, Col. Leith Hay of Rannes, C.B., Leith Hall, Kinnethmont; *Secretary*, John Gartly, Inch. 2 Medals. Granted 1874.
7. KEIG POULTRY AND DAIRY PRODUCE ASSOCIATION.—*Convener*, Lord Forbes, Castle Forbes, Keig, Aberdeen; *Secretary*, George Bruce, Wealthiton, Keig, Whitehouse, Aberdeen. 2 Medals. Granted 1872.
8. KINCARDINE O'NEIL AND UPPER DEESIDE ASSOCIATION.—*Convener*, Col. Innes of Learney, Torphins; *Secretary*, Alexander Niven, Craig-myle Mills, Torphins. 7 Medals. Granted 1871 and 1873.
9. KINNETHMONT SOCIETY.—*Convener*, Col. Leith Hay of Rannes, C.B., Leith Hall, Kinnethmont; *Secretary*, William Gerrard, Schoolhouse Kinnethmont. 3 Medals. Granted 1874.

10. MAR ASSOCIATION.—*Convener*, Wm Wishart, Cairntradlin, Blackburn, Aberdeen; *Secretary*, Silvester Campbell, Kinnellar, Blackburn, Aberdeen. 4 Medals. Granted 1874.
11. NORTH-EAST ABERDEENSHIRE SOCIETY.—*Convener*, Alex. Lovie, Nether Boyndlie, Fraserburgh; *Secretary*, John Bell, Merryhillock, Fraserburgh. 6 Medals. Granted 1873.
12. NORTH OF SCOTLAND ROOT, VEGETABLE, AND FRUIT ASSOCIATION.—*Convener*, Lieut.-Col. Ramsay of Baira, Straloch, Aberdeen; *Secretary*, James Smith, High Street, Inverurie. 2 Medals. Granted 1874.
13. STRICHEN SOCIETY.—*Convener*, Alex. Whitelaw, M.P.; *Secretary*, John Sleigh, Strichen. 1 Medal. Granted 1873.
14. VALE OF ALFORD TURNIP ASSOCIATION.—*Convener*, R. O. Farquharson of Haughton, Alford, N.B.; *Secretary*, J. Reid, Bents, Alford. 2 Medals. Granted 1875.
15. WARTHILL TURNIP CLUB.—*Convener*, William Leslie of Warthill, Pitcaple; *Secretary*, Adam Singer, Rothmaise, Inch. 2 Medals. Granted 1873.

*Argyllshire.*

16. KINTYRE SOCIETY.—*Convener*, John Lorn Stewart of Coll, Campbeltown; *Secretary*, Thomas Brown, Campbeltown. 4 Medals. Granted 1873.
17. STRONTIAN SOCIETY.—*Convener*, Sir Thomas Miles Riddell, Barr Strontian; *Secretary*, Alexander Kinnear, Strontian, Fort-William. 2 Medals. Granted 1871.

*Ayrshire.*

18. CARRICK SOCIETY.—*Convener*, James Baird of Cambusdoon, Ayr; *Secretary*, David Brown, Banker, Maybole. 5 Medals. Granted 1872.
19. COYLTON AND STAIR SOCIETY.—*Convener*, Major-General Burnett of Gadgirth, Tarbolton; *Secretary*, Robert Caldwell, Knockshoggle. Coynton, Ayr. 2 Medals. Granted 1874.
20. CRAIGIE SOCIETY.—*Convener*, James Picken, Laigh Langside, Craigie, Kilmarnock; *Secretary*, Andrew M'Farlane, Schoolhouse, Craigie. 3 Medals. Granted 1874.
21. DALRY SOCIETY.—*Convener*, Andrew Allan, Munnock, Dalry; *Secretary*, Robert Craig, Flashwood, Dalry. 2 Medals. Granted 1872.
22. DUNDONALD CLUB.—*Convener*, the Hon. G. R. Vernon, Auchans House, Kilmarnock; *Secretary*, John Caldwell, Ploughland, Dundonald. 2 Medals. Granted 1871.
23. GIRVAN DISTRICT SOCIETY.—*Convener*, Captain Hamilton of Pinmore; *Secretary*, Robert Lamb, Girvan. 2 Medals. Granted 1875.
24. IRVINE SOCIETY.—*Convener*, James Stewart, Heathfield, Irvine; *Secretary*, A. C. M'Jannet, writer, Irvine. 2 Medals. Granted 1875.
25. KILMARNOCK CLUB.—*Convener*, Fredrick J. Turner, The Dean, Kilmarnock; *Secretaries*, James and W. H. Wilson, Kilmarnock. 3 Medals. Granted 1872 and 1874.
26. KIRKMICHAEL SOCIETY.—*Convener*, John Rankine of Beoch, Lochlands, Maybole; *Secretary*, David Hunter, Cairnhill, Kirkmichael, Maybole. 4 Medals. Granted 1874.
27. LOUDOUN SOCIETY.—*Convener*, Robert Mackie, Loudoun Cottage, Galston; *Secretary*, Hugh Morton, Loudoun Arms, Newmilns. 2 Medals. Granted 1872.

28. **MUIRKIRK ASSOCIATION.**—*Convener*, James Baird of Cambusdoon, Ayr; *Secretary*, Alex. Donald, The Schoolhouse, Muirkirk. 6 Medals. Granted 1873.
29. **NEW CUMNOCK SOCIETY.**—*Convener*, John Hyslop of Bank, New Cumnock; *Secretary*, Wm. Lennox, Whitehill, New Cumnock. 4 Medals. Granted 1874.
30. **SYMINGTON SOCIETY.**—*Convener*, Col. J. G. Hay Boyd of Townend, Symington, Kilmarnock; *Secretary*, Wm. Wakelin, schoolmaster, Symington, Kilmarnock. 2 Medals. Granted 1874.

*Banffshire.*

31. **CENTRAL BANFFSHIRE CLUB.**—*Convener*, William Longmore, Keith; *Secretary*, James Geddes Brown, Keith. 6 Medals. Granted 1872 and 1873.

*Berwickshire.*

32. **LAMMERMOOR PASTORAL SOCIETY.**—*Convener*, John Turnbull of Abbey St Bathans; *Secretary*, John Caverhill, Greenburn, Ayton. 2 Medals. Granted 1875.

*Dumbartonshire.*

33. **DUMBARTONSHIRE SOCIETY.**—*Convener*, Alex. Smollett of Bonhill, Cameron House, Alexandria, N.B.; *Secretary*, Wm. W. Murray, Catter House, Drymen. 4 Medals. Granted 1873 and 1874.
34. **WESTERN DISTRICT OF DUMBARTONSHIRE.**—*Convener*, Sir James Colquhoun of Luss, Bart., Rossdhu, Luss; *Secretary*, Andrew Wyllie, Camstraddan, Luss. 2 Medals. Granted 1871.

*Dumfriesshire.*

35. **ANNANDALE FARMERS' CLUB.**—*Convener*, J. J. Hope Johnstone of Annandale; *Secretary*, John Baird, jun., Lockerbie. 4 Medals. Granted 1875.
36. **NITHSDALE SOCIETY.**—*Convener*, J. Gilchrist Clark of Speddoch Dabton, Thornhill; *Secretary*, Dr Russell, Thornhill. 2 Medals. Granted 1870. (One year in abeyance.)
37. **SANQUHAR SOCIETY.**—*Convener*, John Gilchrist Clark of Speddoch Dabton, Thornhill; *Secretary*, W. O. Macqueen, Sanquhar. 4 Medals. Granted 1870. (One year in abeyance.)

*Edinburghshire.*

38. **DALKEITH SOCIETY.**—*Convener*, Sir James Gardiner Baird, Bart., Inch House, Liberton; *Secretary*, James Wilson, Wester Cowden, Dalkeith. 6 Medals. Granted 1872.

*Fifeshire.*

39. **AUCHTERMUCHTY SOCIETY.**—*Convener*, John Bogie, Balcanquhal, Auchtermuchty; *Secretary*, H. W. Walker, Auchtermuchty. 5 Medals. Granted 1874.
40. **DUNNIKIER SOCIETY.**—*Convener*, J. T. Oswald of Dunnikier, Kirkcaldy; *Secretary*, John Kidd, Dunnikier, Kirkcaldy. 2 Medals. Granted 1874.
41. **KINGLASSIE SOCIETY.**—*Convener*, R. Sinclair Aytoun of Inchdairnie, Kirkcaldy; *Secretary*, David Beath, Auchmuir, Leslie. 2 Medals. Granted 1870. (One year in abeyance.)

42. WINDYGATES SOCIETY.—*Convener*, John Gilmour of Lundin, Leven; *Secretary*, John Laurie, Kirklandhill, Leven. 2 Medals. Granted 1875.

*Inverness-shire.*

43. STRATHSPEY SOCIETY.—*Convener*, The Earl of Seafield; *Secretary*, Francis Macbean, Factor's Office, Grantown. 5 Medals. Granted 1872.

*Kincardineshire.*

44. STRACHAN FLOWER, POULTRY, AND DAIRY SHOW.—*Convener*, John Masson, Mill of Cammie, Banchory.—*Secretary*, Neil Gilchrist, Schoolhouse, Strachan, Banchory. 2 Medals. Granted 1874.

*Kinross-shire.*

45. KINROSS-SHIRE SOCIETY.—*Convener*, Harry Young of Cleish Castle, Kinross; *Secretary*, James Beveridge of Balado, Kinross. 2 Medals. Granted 1870. (One year in abeyance.)

*Lanarkshire.*

46. CALDER WATERHEAD SOCIETY.—*Convener*, Peter Forrest of Heirmyres, City of Glasgow Bank, Shotts; *Secretary*, James Ferguson, Fernieshaw, Holytown. 2 Medals. Granted 1873.
47. UPPER WARD OF LANARKSHIRE ASSOCIATION.—*Convener*, Andrew Smith, Castle Mains, Douglas; *Secretary*, James Symington, auctioneer, Lanark. 2 Medals. Granted 1874.

*Lanlithgowshire.*

48. BATHGATE ASSOCIATION.—*Convener*, John Waddell of Easter Inch, Bathgate; *Joint-Secretaries*, M. Chapman and G. M. Johnston, Bathgate. 4 Medals. Granted 1873.
49. BIGGAR CLUB.—*Convener*, R. G. Murray of Spittal, Biggar *Secretary*, Alexander Watt, Biggar. 3 Medals. Granted 1874.

*Nairnshire.*

50. NAIRNSHIRE SOCIETY.—*Convener*, W. A. Stables, Cawdor Castle, Nairn; *Secretary*, John Joss, Budgate, Cawdor, Nairn. 5 Medals. Granted 1871.

*Perthshire.*

51. DUNNING SOCIETY.—*Convener*, James Morison, Rossie, Dunning; *Secretary*, Wm. Bruce, merchant, Dunning. 1 Medal. Granted 1873.
52. MOULIN ASSOCIATION.—*Convener*, H. B. Stewart of Balnakilly, Pitlochry; *Secretary*, D. M'Gillewie, Pitlochry. 1 Medal. Granted 1873.
53. SCOTTISH MIDLAND ASSOCIATION.—*Convener*, Sir Wm. Stirling Maxwell of Keir, Bart., M.P., Dunblane; *Secretary*, Melville Jameson, Perth. 4 Medals. Granted 1872.
54. STRATHEARN CENTRAL SOCIETY.—*Convener*, William Morison, Cairnie, Forteviot; *Secretary*, Robert Gardiner, Chapel Bank, Auchterarder. 2 Medals. Granted 1872.
55. UPPER STRATHEARN SOCIETY.—*Convener*, D. R. Williamson of Lawers, Crieff; *Secretary*, James M'Laren, Crieff. 3 Medals. Granted 1873.

*Renfrewshire.*

56. LOWER WARD OF RENFREWSHIRE SOCIETY.—*Convener*, Sir Michael R. Shaw Stewart of Ardgowan, Bart., Greenock; *Secretary*, D. L. Macadam, Mansion House, Greenock. 4 Medals. Granted 1873.
57. MEARNS SOCIETY.—*Convener and Secretary*, John Pollok, Blackhouse, Newton Mearns. 2 Medals. Granted 1874.

*Stirlingshire.*

58. BUCKLYVIE AND GARTMORE ASSOCIATION.—*Convener*, W. A. MacLachlan of Auchentroig, Balfroun; *Secretary*, Andrew Dun, Bucklyvie. 2 Medals. Granted 1875.

*Wigtownshire.*

59. KIRKMAIDEN SOCIETY.—*Convener and Secretary*, Gilbert R. Murray, Chapelrossan, Stranraer. 5 Medals. Granted 1871 and 1873.

The Medals are given for Five consecutive years.

Applications from other Districts must be lodged with the Secretary of the Society *by 1st November next*.

## RULES OF COMPETITION.

1. All Competitions must be at the instance of a local Society.
2. The classes for which Medals are granted must be in accordance with the list at pages 39 and 40.
3. In each District the Convener (who must be a Member of the Society appointed by the Directors) shall fix the time and place of Competition, appoint the Judges, and make all other necessary arrangements, in concurrence with the other Members of the Society, and the local Association of the District.
4. The Money Premiums given in the District must be L.2 for each Medal claimed.
5. The Committee shall select the breed, and specify it in the return.
6. The quantity of seed shown in Competition by each Grower must not be less than one quarter of each variety of Grain, or four bushels of Beans or Grass Seeds. The first Premium awarded by the District shall not be less than L.1 for each kind of Grain for which a Medal is claimed. The Judges shall be guided in their awards—1st, By the purity of the Seed; 2d, By its freeness from extraneous Seeds; and 3d, Where there is an equality in these respects, by the weight. The varieties for which premiums have been given must be named.
7. The Medal for Sheep Shearing shall not be awarded unless there are three competitors, and it shall always accompany the highest money premium. There must not be fewer than two competitors in all the other classes.
8. Blank reports will be furnished to all the Conveners of the different Districts. These must, in all details, be completed and lodged with the Secretary *on or before the 1st of November next*, with the exception of green crop reports, which must be forwarded on or before the 20th of December, for the approval of the Directors, against whose decisions there shall be no more appeal.
9. When a grant has expired, the District cannot apply again for aid for 2 years.

## SECTION 8.—PLOUGHING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first or highest Premium at Ploughing Competitions, provided a



Report in the following terms is made to the Secretary, within one month of the Competition, by a member of the Society:—

## FORM OF REPORT.

I, \_\_\_\_\_ of \_\_\_\_\_ Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the \_\_\_\_\_ Association at \_\_\_\_\_ in the county of \_\_\_\_\_ on the \_\_\_\_\_ when \_\_\_\_\_ ploughs competed; \_\_\_\_\_ of land was assigned to each, and \_\_\_\_\_ hours were allowed for the execution of the work. The sum of L. \_\_\_\_\_ was awarded in the following proportions, viz.:

[Here enumerate the names and designations of successful Competitors.]

## RULES OF COMPETITION.

1. All matches must be at the instance of a local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants on one estate, will be recognised.

2. The title of such Society or Association, together with the name and address of the Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 3 George IV. Bridge, Edinburgh.

3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.

4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Society who was present at it.

5. A Member can only report one Match, and a Ploughman can only carry one Medal in the same season.

6. To warrant the Medal, there must have been twelve ploughs in Competition, and Three Pounds awarded in Premiums. The Medal to be given to the winner of the first or highest prize.

7. Ploughmen shall not be allowed any assistance, and their work must not be set up nor touched by others: on land of average tenacity the ploughing should be at the rate of an imperial acre in ten hours, and attention should be given to the firmness and sufficiency of the work below, more than to its neatness above the surface.

## SECTION 9.—COTTAGES AND GARDENS.

The following Premiums are offered for Competition in the Parishes after-mentioned.

The Premiums for Cottages and Gardens are given for Five consecutive years.

## I. PREMIUMS FOR BEST KEPT COTTAGES AND GARDENS.

1. Best kept Cottage in each Parish—One Pound; and where there are four Competitors—Minor Silver Medal.

Second best—Ten Shillings.

Third best—Minor Silver Medal.

2. Best kept Cottage Garden in each Parish—One Pound; and where there are four Competitors—Minor Silver Medal.  
Second best—Ten Shillings.  
Third best—Minor Silver Medal.

*Aberdeenshire.*

1. CRATHIE AND BRAEMAR.—*Convener and Secretary*, Dr Robertson, Indego, Tairland. Granted 1872.

*Berwickshire.*

2. SINCLAIRSHILL HORTICULTURAL SOCIETY.—*Convener*, Archibald Campbell Swinton of Kimmerghame, Dunse; *Secretary*, David Jack, The Gardens, Kimmerghame, Dunse. Granted 1873.

*Edinburghshire.*

3. CRAMOND.—*Convener*, Henry Davidson of Muirhouse, Davidson's Mains, Edinburgh; *Secretary*, John Cooper, Barnton Gardens, Davidson's Mains. Granted 1871.

*Fifehire.*

4. NEWBURGH GARDENING SOCIETY.—*Convener*, John Lyell, Newburgh; *Secretary*, Robert Clark, Newburgh. Granted 1874.

*Kincardineshire.*

5. FETTERCAIRN AMATEUR HORTICULTURAL SOCIETY.—*Convener*, Lieut.-Col. McInroy of The Burn, Brechin; *Secretary*, James Robb, Fettercairn. Granted 1875.

*Linlithgowshire.*

6. DALMENY AND QUEENSFERRY HORTICULTURAL SOCIETY.—*Convener*, Peter Glendinning, Dalmeny Park, Edinburgh; *Secretary*, Arthur H. Glendinning, The Leuchold, Dalmeny Park, Edinburgh. Granted 1872.
7. KIRKLISTON HORTICULTURAL ASSOCIATION.—*Convener*, Peter Glendinning, Dalmeny Park, Edinburgh; *Secretary*, H. O. Grieve, Kirkliston. Granted 1874.

*Perthshire.*

8. DUNBARNEY, including that portion of Craigend in the parish of Perth.—*Convener*, Sir Thomas Moncreiffe of Moncreiffe, Bart., Bridge of Earn; *Secretary*, Henry Methven, Dunbarney House, Bridge of Earn. Granted 1874.

RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Gentlemen's Lodges and Gardeners' Houses, as well as Gentlemen's Servants occupying Cottages in the Policies, or on land in the natural possession of their masters, are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It is left to the Committee of the district to regulate the maximum annual rent of the Cottages, which may, with the garden, be from L.5 to L.7.

4. A person who has gained the highest premium cannot compete again, but will be entitled to a Medal if certified by the Committee to be equal in merit to the first on the list of Competitors.

5. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is of thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly—the windows must be free of broken glass, clean, and affording the means of ventilation. Dung-hills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

6. In estimating the claims for the Garden Premiums, the judges should have in view:—The sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

7. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be transmitted by the Conveners to the Secretary *on or before the 1st November next*.

8. When a Grant has expired the District cannot apply again for aid for two years.

Parishes desirous of these Premiums must lodge applications with the Secretary *on or before the 1st November next*.

## 2. MEDALS FOR COTTAGES AND GARDENS OR GARDEN PRODUCE.

The Society will issue annually two Medium Silver Medals to a limited number of local Associations or individuals, who at their own expense establish premiums for Cottages or Gardens under L.15 of Rent. The Medals may be awarded for best kept Cottage, and best kept Garden or Flower Plot, or Garden Produce.

Local Associations or individuals desirous of these Medals, must lodge applications with the Secretary *on or before the first of November next*. The Medals are given for five consecutive years.

### *Aberdeenshire.*

1. CLUNY.—*Convener*, John Gordon of Cluny, Aberdeen; *Secretary*, James Barron, Blackstock, Cluny. Granted 1871.
2. KEIG CLUB.—*Convener*, Lord Forbes, Castle Forbes, Keig, Aberdeen; *Secretary*, George Bruce, Wealthiton, Keig. Granted 1873.

### *Ayrshire.*

3. STEWARTON FARMER SOCIETY.—*Convener and Secretary*, John Lindsay, Thornhill, Stewarton. Granted 1875.

### *Dumbartonshire.*

4. VALE OF LEVEN AND DUMBARTON HORTICULTURAL SOCIETY.—*Convener*, Sir James Lumsden of Arden; *Secretary*, John M'Kinnon, Vere Place, Alexandria, N.B. Granted 1872.

### *Edinburghshire.*

5. ROSLIN HORTICULTURAL SOCIETY.—*Convener*, William Merricks, Roslin; *Secretary*, R.D. Glover, Roslin. Granted 1874.

### *Elginshire.*

6. MULBEN.—*Convener*, Alexander Paterson, Mulben, Keith. Granted 1873.

### *Fifeshire.*

7. AUCHTERMUCHTY AND STRATHMIGLO HORTICULTURAL SOCIETY.—*Convener*, R. Cathart of Pitcairle; *Secretary*, Archibald Walter, Auchtermuchty. Granted 1875.

*Lanarkshire.*

8. HUTCHESONTOWN GARDENS.—*Secretary*, Robert Hamilton, 62 Camden Street (Southside), Glasgow. Granted 1872.
9. SHETTLESTON HORTICULTURAL SOCIETY.—*Secretary*, J. Bulloch Logan, Shettleston. Granted 1872.

*Linlithgowshire.*

10. ECCLESMACHAN.—*Convener*, James Thomson, Holms, Broxburn; *Secretary*, James Cunningham, teacher, Ecclesmachan. Granted 1871.

## REGULATIONS.

1. Competitions may take place in the different districts for Cottages and Gardens, or for either separately.

2. The annual value of each Cottage, with the ground occupied in the parish by a Competitor, must not exceed L.15.

3. If Competition takes place for Garden Produce in place of the best kept Garden, such produce must be *bona fide* grown in the Exhibitor's Garden, and he will not be allowed to make up a Collection from any other Garden.

4. Blank reports will be furnished to the Conveners and Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary, *on or before the 1st November next*, for the approval of the Directors, against whose decisions there shall be no appeal.

5. When a grant has expired the District cannot apply again for aid for two years.

## 3. IMPROVING EXISTING COTTAGES.

To the Proprietor in Scotland who shall report the Improvement of the greatest number of Cottages in the years 1872, 1873, and 1874—The Gold Medal.

## 4. BUILDING NEW COTTAGES.

To the Proprietor in Scotland who shall report the Erection of the greatest number of approved Cottages during the years 1871, 1872, 1873, and 1874,—The Gold Medal.

## RULES OF COMPETITION.

1. Claims for the Premiums Nos. 3 and 4 must be lodged with the Secretary on or before the 1st of October next, to allow an inspection to be made of the different Cottages. The inspection will be conducted by a Committee of the Society's Members, and Reports must be transmitted to the Secretary *on or before the 1st of November*.

2. The annual value of the Cottage or Cottages separately, with the garden ground, must not exceed L.5.

3. In estimating the claims of the Competitors, the following points will be kept in view:—The external appearance of the Cottages; their internal accommodation; the arrangements of the out-houses; the means of drainage and ventilation; and the expense of the building or of the alteration, compared with its durability and accommodation. When the Cottages of one Competitor are superior in style and comfort to those of another, though not so numerous, the Inspectors will give them the preference, provided they amount at least to three, and have been erected at a moderate expense.

4. Parties competing will forward to the Society Plans, Specifications, and Estimates, of which, and of all information sent therewith, copies may be taken for publication, if the Society shall see fit, and the originals returned to the parties within six months if desired.

## GENERAL SHOW OF STOCK, DAIRY PRODUCE, AND IMPLEMENTS

AT

GLASGOW

ON 27TH, 28TH, 29TH, AND 30TH JULY 1875.

---

President of the Society.

His Royal Highness the PRINCE of WALES.

Convener of the Local Committee.

Sir MICHAEL R. SHAW STEWART of Blackhall, Bart.

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The District connected with the Show comprises the Counties of LANARK,  
AYR, ARGYLL, RENFREW, and BUTE.

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### GENERAL ARRANGEMENTS.

#### STOCK, POULTRY, AND DAIRY PRODUCE

To be entered with the Secretary on or before Wednesday, 9th June. Received in the Yard on Monday, 26th, and till noon on Tuesday, 27th July. Judged at 1 p.m. on Tuesday. Exhibited on Tuesday, Wednesday, Thursday, and Friday, 27th, 28th, 29th, and 30th July.

#### IMPLEMENTS

To be entered with the Secretary on or before Wednesday, 9th June. Received in the Yard on Tuesday, 20th July, and till the evening of Monday, 26th July. Exhibited Tuesday, Wednesday, Thursday, and Friday, 27th, 28th, 29th, and 30th July.

#### TERMINATION OF SHOW.

Friday, 30th July, at 5 p.m. Stock and Implements may remain in the Yard till Saturday afternoon.

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The Competition is open to Exhibitors from all parts of the United Kingdom. Members of the Society are admitted free during the Show. New Members may be proposed for election at the General Meeting in June, and if on the list of Candidates may enter at Members' rates; but all entries must be made on or before Wednesday, 9th June.

## PREMIUMS.

*The Medium Gold Medal will be given to any animal which, having gained the Society's highest Premium at Stirling 1873, or Inverness 1874, in the Classes of Aged Bulls—Cows—Stallions—or Mares, is disqualified from again competing. See General Conditions Nos. 23 and 24.*

## CLASS I.—CATTLE.

## SECTION

## SHORT-HORN.

1. Best Bull calved before 1st Jan. 1873, . . . . .	£25
Second best, . . . . .	15
Third best, . . . . .	10
Fourth best (Reserve Number), . . . . .	...
Breeder of best Bull, . . . . .	The Silver Medal.
2. Best Bull calved after 1st Jan. 1873, . . . . .	25
Second best, . . . . .	15
Third best, . . . . .	10
Fourth best (Reserve Number), . . . . .	...
3. Best Bull calved after 1st Jan. 1874, . . . . .	15
Second best, . . . . .	10
Third best, . . . . .	5
Fourth best (Reserve Number), . . . . .	...
4. Best Cow of any age, . . . . .	20
Second best, . . . . .	10
Third best, . . . . .	5
Fourth best (Reserve Number), . . . . .	...
5. Best Heifer calved after 1st Jan. 1873, . . . . .	15
Second best, . . . . .	10
Third best, . . . . .	5
Fourth best (Reserve Number), . . . . .	...
6. Best Heifer calved after 1st Jan. 1874, . . . . .	10
Second best, . . . . .	8
Third best, . . . . .	4
Fourth best (Reserve Number), . . . . .	...
	<hr/>
	£217

## POLLED ANGUS OR ABERDEEN.

7. Best Bull calved before 1st Jan. 1873, . . . . .	£20
Second best, . . . . .	10
Third best, . . . . .	5
Fourth best (Reserve Number), . . . . .	...
Breeder of best Bull, . . . . .	The Silver Medal.
	<hr/>
Carry forward	£35
	<hr/>
	£217

POLLED ANGUS OR ABERDEEN—*continued.*

SECTION	Brought forward,	£35	£217
8. Best Bull calved after 1st Jan. 1873,	.	20	
Second best,	.	10	
Third best,	.	5	
Fourth best (Reserve Number),	.	...	
9. Best Bull calved after 1st Jan. 1874,	.	10	
Second best,	.	5	
Third best,	.	3	
Fourth best (Reserve Number),	.	...	
10. Best Cow of any age,	.	20	
Second best,	.	10	
Third best,	.	5	
Fourth best (Reserve Number),	.	...	
11. Best Heifer calved after 1st Jan. 1873,	.	10	
Second best,	.	6	
Third best,	.	4	
Fourth best (Reserve Number),	.	...	
12. Best Heifer calved after 1st Jan. 1874,	.	8	
Second best,	.	5	
Third best,	.	3	
Fourth best (Reserve Number),	.	...	
		<hr/>	159

## GALLOWAY.

13. Best Bull calved before 1st Jan. 1873,	.	20	
Second best,	.	10	
Third best,	.	5	
Fourth best (Reserve Number),	.	...	
Breeder of best Bull,	The Silver Medal.		
14. Best Bull calved after 1st January 1873,	.	20	
Second best,	.	10	
Third best,	.	5	
Fourth best (Reserve Number),	.	...	
15. Best Bull calved after 1st Jan. 1874,	.	10	
Second best,	.	5	
Third best,	.	3	
Fourth best (Reserve Number),	.	...	
16. Best Cow of any age,	.	20	
Second best,	.	10	
Third best,	.	5	
Fourth best (Reserve Number),	.	...	
17. Best Heifer calved after 1st Jan. 1873,	.	10	
Second best,	.	6	
Third best,	.	4	
Fourth best (Reserve Number),	.	...	
18. Best Heifer calved after 1st Jan. 1874,	.	8	
Second best,	.	5	
Third best,	.	3	
Fourth best (Reserve Number),	.	...	
		<hr/>	159
Carry forward,			£535

SECTION

Brought forward, £535

## AYRSHIRE.

19.	Best Bull calved before 1st Jan. 1873, . . .	£20
	Second best, . . . . .	10
	Third best, . . . . .	5
	Fourth best, . . . . .	3
	Fifth best (Reserve Number), . . . . .	...
	Breeder of best Bull, The Silver Medal.	
20.	Best Bull calved after 1st Jan. 1873, . . .	20
	Second best, . . . . .	10
	Third best, . . . . .	5
	Fourth best, . . . . .	3
	Fifth best (Reserve Number), . . . . .	...
21.	Best Bull calved after 1st Jan. 1874, . . .	10
	Second best . . . . .	5
	Third best . . . . .	3
	Fourth best, . . . . .	2
	Fifth best (Reserve Number), . . . . .	..
22.	Best Cow in Milk calved before 1st January 1872, .	20
	Second best, . . . . .	10
	Third best, . . . . .	5
	Fourth best, . . . . .	3
	Fifth best (Reserve Number), . . . . .	..
23.	Best Cow in Milk calved after 1st Jan. 1872, . .	20
	Second best, . . . . .	10
	Third best, . . . . .	5
	Fourth best . . . . .	3
	Fifth best (Reserve Number), . . . . .	...
24.	Best Cow in Calf, of any age, or Heifer in	
	Calf, calved before 1st Jan. 1873, . . .	15
	Second best, . . . . .	10
	Third best, . . . . .	5
	Fourth best, . . . . .	3
	Fifth best (Reserve Number), . . . . .	...
25.	Best Heifer calved after 1st Jan. 1873, . . .	10
	Second best, . . . . .	6
	Third best, . . . . .	4
	Fourth best, . . . . .	2
	Fifth best (Reserve Number), . . . . .	...
26.	Best Heifer calved after 1st Jan. 1874, . . .	8
	Second best, . . . . .	5
	Third best, . . . . .	3
	Fourth best, . . . . .	2
	Fifth best (Reserve Number), . . . . .	...

245

Carry forward

£780



SECTION Brought forward, £780

## HIGHLAND.

27.	Best Bull calved before 1st Jan. 1872, . . .	£20
	Second best, . . . . .	10
	Third best, . . . . .	5
	Fourth best (Reserve Number), . . .	...
	Breeder of best Bull, . . . The Silver Medal	
28.	Best Bull calved after 1st Jan. 1872, . . .	20
	Second best, . . . . .	10
	Third best, . . . . .	5
	Fourth best (Reserve Number), . . .	...
29.	Best Bull calved after 1st Jan. 1873, . . .	10
	Second best, . . . . .	5
	Third best, . . . . .	3
	Fourth best (Reserve Number), . . .	...
30.	Best Cow of any age, . . . . .	15
	Second best, . . . . .	8
	Third best, . . . . .	4
	Fourth best (Reserve Number), . . .	...
31.	Best Heifer calved after 1st Jan. 1872, . . .	10
	Second best, . . . . .	5
	Third best, . . . . .	3
	Fourth best (Reserve Number), . . .	...
32.	Best Heifer calved after 1st Jan. 1873 . . .	8
	Second best, . . . . .	4
	Third best, . . . . .	2
	Fourth best (Reserve Number), . . .	...

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## FAT STOCK.

33.	Best Shorthorn Ox calved after 1st Jan. 1872, . . .	6
	Second best, . . . . .	3
	Third best (Reserve Number), . . .	...
34.	Best Shorthorn Ox calved after 1st Jan. 1873, . . .	5
	Second best, . . . . .	2
	Third best (Reserve Number), . . .	...
35.	Best Highland Ox calved after 1st Jan. 1871, . . .	6
	Second best, . . . . .	3
	Third best (Reserve Number), . . .	...
36.	Best Ditto, calved after 1st Jan. 1872, . . .	5
	Second best, . . . . .	2
	Third best (Reserve Number), . . .	...
37.	Best Ox, of any other Pure or Cross Breed calved after 1st Jan. 1872, . . .	6
	Second best, . . . . .	3
	Third best (Reserve Number), . . .	...
38.	Best Ditto, calved after 1st Jan. 1873, . . .	5
	Second best, . . . . .	2
	Third best (Reserve Number,) . . .	...

Carry forward, £48

£927

		FAT STOCK— <i>continued.</i>			
SECTION	Brought forward,			£48	£927
39. Best Cross-bred Heifer, calved after 1st					
Jan. 1872,	.	.	.	6	
Second best,	.	.	.	3	
Third best (Reserve Number),	.	.	.	...	
40. Best Cross-bred Heifer, calved after 1st					
Jan. 1873,	.	.	.	5	
Second best,	.	.	.	2	
Third best (Reserve Number),	.	.	.	...	
				—	64
					£991

## CLASS II.—HORSES

FOR AGRICULTURAL PURPOSES.

1. Best Stallion foaled before 1st Jan. 1872, . . . . .	£30
Second best, . . . . .	20
Third best, . . . . .	10
Fourth best, . . . . .	5
Fifth best (Reserve Number), . . . . .	...
Breeder of best Stallion, The Silver Medal.	
2. Best Entire Colt foaled after 1st Jan. 1872, . . . . .	20
Second best, . . . . .	15
Third best, . . . . .	10
Fourth best, . . . . .	5
Fifth best (Reserve Number), . . . . .	...
3. Best Entire Colt foaled after 1st Jan. 1873, . . . . .	15
Second best, . . . . .	8
Third best, . . . . .	4
Fourth best, . . . . .	2
Fifth best (Reserve Number), . . . . .	...
4. Best Entire Colt foaled after 1st Jan. 1874, . . . . .	10
Second best, . . . . .	6
Third best, . . . . .	4
Fourth best, . . . . .	2
Fifth best (Reserve Number), . . . . .	...
5. Best Mare (with Foal at foot) foaled before 1st Jan. 1872, . . . . .	25
Second best, . . . . .	15
Third best, . . . . .	10
Fourth best, . . . . .	5
Fifth best (Reserve Number), . . . . .	...
6. Best Mare (in Foal) foaled before 1st Jan. 1872, . . . . .	20
Second best, . . . . .	10
Third best, . . . . .	5
Fourth best, . . . . .	3
Fifth best (Reserve Number), . . . . .	...

Carry forward, £259

HORSES FOR AGRICULTURAL PURPOSES—*continued*.

SECTION	Brought forward,	£259
7. Best Filly foaled after 1st Jan. 1872, . . . . .		10
Second best, . . . . .		5
Third best, . . . . .		3
Fourth best, . . . . .		2
Fifth best (Reserve Number), . . . . .		...
8. Best Filly foaled after 1st Jan. 1873, . . . . .		8
Second best, . . . . .		4
Third best, . . . . .		2
Fourth best, . . . . .		1
Fifth best (Reserve Number), . . . . .		...
9. Best Filly foaled after 1st Jan. 1874, . . . . .		6
Second best, . . . . .		4
Third best, . . . . .		2
Fourth best, . . . . .		1
Fifth best (Reserve Number), . . . . .		...
10. Best Draught Gelding foaled before 1st Jan. 1872, . . . . .		8
Second best, . . . . .		4
Third best, . . . . .		2
Fourth best (Reserve Number), . . . . .		...
11. Best Draught Gelding, foaled after 1st Jan. 1872, . . . . .		6
Second best, . . . . .		3
Third best, . . . . .		1
Fourth best (Reserve Number), . . . . .		...
12. Best Mare or Gelding, not exceeding 15 hands, for Milk Carts of heavy draught, . . . . .		10
Second best, . . . . .		5
Third best, . . . . .		3
Fourth best (Reserve Number), . . . . .		...
13. Best Mare or Gelding, not exceeding 14½ hands, for Milk Carts of light draught, . . . . .		10
Second best, . . . . .		5
Third best, . . . . .		3
Fourth best (Reserve Number), . . . . .		...
		<hr/>
		367

## HUNTERS AND ROADSTERS.

14. Best Brood Mare (with Foal at foot), suitable for Field, foaled before 1st Jan. 1871, . . . . .	20
Second best, . . . . .	10
Third best, . . . . .	5
Fourth best (Reserve Number), . . . . .	...
15. Best Yeld Mare or Gelding, suitable for Field, (light weight), foaled before 1st Jan. 1871, . . . . .	20
Second best, . . . . .	10
Third best, . . . . .	5
Fourth best (Reserve Number), . . . . .	...

Carry forward, £70      £367

HUNTERS AND ROADSTERS—*continued*

SECTION	Brought forward	£70	£367
16. Best Yeld Mare or Gelding, suitable for Field, (heavy weight), foaled before 1st Jan. 1871,		20	
Second best,		10	
Third best,		5	
Fourth best (Reserve Number),		...	
17. Best Filly or Gelding, suitable for Field, foaled after 1st Jan. 1871,		15	
Second best,		8	
Third best,		4	
Fourth best (Reserve Number),		...	
18. Best Filly or Gelding, suitable for Field, foaled after 1st Jan. 1872,		10	
Second best,		5	
Third best,		3	
Fourth best (Reserve Number),		...	
19. Best Stallion, Mare, or Gelding, for Leaping,		10	
Second best,		5	
Third best,		3	
Fourth best (Reserve Number),		...	
20. Best Mare or Gelding, suitable for Carriage, foaled before 1st January 1872,		20	
Second best,		10	
Third best,		5	
Fourth best (Reserve Number),		...	
21. Best Mare or Gelding, suitable as Roadster,		10	
Second best,		5	
Third best,		3	
Fourth best (Reserve Number),		...	
22. Best Mare or Gelding, suitable as Hackney or Roadster, between 14 and 15 hands high,		8	
Second best,		4	
Third best,		2	
Fourth best (Reserve Number),		...	

## PONIES.

23. Best Highland Stallion, 14½ hands and under,	6
Second best,	3
Third best,	1
Fourth best (Reserve Number),	
24. Best Highland Mare or Gelding, between 12 and 14½ hands high,	6
Second best,	3
Third best,	1
Fourth best (Reserve Number),	

Carry forward, £20      £60;

PONIES—*continued*.

SECTION	Brought forward,	£20	£602
25. Best Mare or Gelding, between 13 and 14 hands high, . . . . .		6	
Second best, . . . . .		3	
Third best, . . . . .		1	
Fourth best (Reserve Number), . . . . .		...	
26 Best Mare or Gelding, between 12 and 13 hands high, . . . . .		6	
Second best, . . . . .		3	
Third best, . . . . .		1	
Fourth best (Reserve Number), . . . . .		...	
27. Best Mare or Gelding, 12 hands and under, . . . . .		6	
Second best, . . . . .		3	
Third best, . . . . .		1	
Fourth best (Reserve Number), . . . . .		...	
		<hr/>	50

## THOROUGH-BRED STALLIONS.

Best Thorough-bred Stallion to serve in the District of the Show in season 1875 (see No. 7 of the General Conditions), . . . . .		50
		<hr/>
		£702

## CLASS III.—SHEEP.

## CHEVIOT.

1. Best Tup above one shear, . . . . .	£12
Second best, . . . . .	6
Third best, . . . . .	3
Fourth best (Reserve Number), . . . . .	...
2. Best Dinmont or Shearling Tup, . . . . .	12
Second best, . . . . .	6
Third best, . . . . .	3
Fourth best (Reserve Number), . . . . .	...
3. Best 5 Ewes above one shear, . . . . .	10
Second best, . . . . .	5
Third best, . . . . .	2
Fourth best (Reserve Number), . . . . .	...
Best Pen of Lambs shown with Ewes, . . . . .	2
Second best, . . . . .	1
4. Best 5 Shearling Ewes or Gimmers, . . . . .	10
Second best, . . . . .	5
Third best, . . . . .	2
Fourth best (Reserve Number), . . . . .	...
	<hr/>
Carry forward,	£79

SECTION	Brought forward,	£79
BLACKFACED.		
5. Best Tup above one shear, . . . .	£12	
Second best, . . . .	6	
Third best, . . . .	3	
Fourth best (Reserve Number), . . . .	...	
6. Best Dinmont or Shearling Tup, . . . .	12	
Second best, . . . .	6	
Third best, . . . .	3	
Fourth best (Reserve Number), . . . .	...	
7. Best 5 Ewes above one shear, . . . .	10	
Second best, . . . .	5	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
Best Pen of Lambs shown with Ewes, . . . .	2	
Second best, . . . .	1	
8. Best 5 Shearling Ewes or Gimmers, . . . .	10	
Second best, . . . .	5	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
	<hr/>	79
BORDER LEICESTER.		
9. Best Tup above one shear, . . . .	£12	
Second best, . . . .	6	
Third best, . . . .	3	
Fourth best (Reserve Number), . . . .	...	
10. Best Dinmont or Shearling Tup, . . . .	12	
Second best, . . . .	6	
Third best, . . . .	3	
Fourth best (Reserve Number), . . . .	...	
11. Best 5 Ewes above one shear, . . . .	10	
Second best, . . . .	5	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
12. Best 5 Shearling Ewes, or Gimmers, . . . .	10	
Second best, . . . .	5	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
	<hr/>	76
LEICESTER.		
13. Best Tup of any age, . . . .	8	
Second best, . . . .	4	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
14. Best 5 Ewes of any age, or Gimmers, . . . .	6	
Second best, . . . .	3	
Third best, . . . .	1	
Fourth best (Reserve Number), . . . .	..	
	<hr/>	24
	Carry forward,	£258

SECTION	Brought forward,	£258
COTSWOLD.		
15. Best Tup of any age, . . . .	£8	
Second best, . . . .	4	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
16. Best 5 Ewes of any age, or Gimmers, . . . .	6	
Second best, . . . .	3	
Third best, . . . .	1	
Fourth best (Reserve Number), . . . .	...	
	—	24
LINCOLN.		
17. Best Tup of any age, . . . .	8	
Second best, . . . .	4	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
18. Best 5 Ewes of any age, or Gimmers, . . . .	6	
Second best, . . . .	3	
Third best, . . . .	1	
Fourth best (Reserve Number), . . . .	...	
	—	24
SOUTHDOWN.		
19. Best Tup of any age, . . . .	8	
Second best, . . . .	4	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
20. Best 5 Ewes of any age, or Gimmers, . . . .	6	
Second best, . . . .	3	
Third best, . . . .	1	
Fourth best (Reserve Number), . . . .	...	
	—	24
SHROPSHIRE.		
21. Best Tup of any age, . . . .	8	
Second best, . . . .	4	
Third best, . . . .	2	
Fourth best (Reserve Number), . . . .	...	
22. Best 5 Ewes of any age, or Gimmers, . . . .	6	
Second best, . . . .	3	
Third best, . . . .	1	
Fourth best (Reserve Number), . . . .	...	
	—	24
EXTRA SHEEP.		
23. Best 5 Cheviot Wethers, not above 4 shear, . . . .	4	
Second best, . . . .	2	
Third best (Reserve Number), . . . .	...	
24. Best 5 Blackfaced Wethers, not above 4 shear, . . . .	4	
Second best, . . . .	2	
Third best (Reserve Number), . . . .	...	
	—	
Carry forward,	£12	£354





SECTION	Brought forward,	£14	£62
<i>SMALL BREED—continued.</i>			
8. Best Sow, . . . . .	.	6	
Second best, . . . . .	.	3	
Third best, . . . . .	.	1	
Fourth best (Reserve Number), . . . . .	.	...	
9. Best Pen of 3 Pigs, not above 8 months old, . . . . .	.	4	
Second best, . . . . .	.	2	
Third best, . . . . .	.	1	
Fourth best (Reserve Number), . . . . .	.	...	
			31
			<hr/> £93

## EXTRA STOCK.

Animals not included in the Sections for Competition may be exhibited as Extra Stock, and will receive Honorary Premiums when specially commended.

## CLASS V.—POULTRY.

FIRST PREMIUM—ONE SOVEREIGN; SECOND PREMIUM—TEN SHILLINGS—in all the Sections of Poultry.

Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1875.

	<i>Section</i>	<i>Section</i>
DORKING— <i>Silver Grey</i> , . . . . .	1. Cock.	2. 2 Hens.
	3. Cockerel.	4. 2 Pullets.
DORKING— <i>Coloured</i> , . . . . .	5. Cock.	6. 2 Hens.
	7. Cockerel.	8. 2 Pullets.
COCHIN-CHINA, . . . . .	9. Cock.	10. 2 Hens.
	11. Cockerel.	12. 2 Pullets.
BRAHMAPOOTRA, . . . . .	13. Cock.	14. 2 Hens.
	15. Cockerel.	16. 2 Pullets.
SPANISH, . . . . .	17. Cock.	18. 2 Hens.
	19. Cockerel.	20. 2 Pullets.
SCOTCH GREY, . . . . .	21. Cock.	22. 2 Hens.
	23. Cockerel.	24. 2 Pullets.
HAMBURG— <i>Pencilled</i> , . . . . .	25. Cock.	26. 2 Hens.
	27. Cockerel.	28. 2 Pullets.
HAMBURG— <i>Spangled</i> , . . . . .	29. Cock.	30. 2 Hens.
	31. Cockerel.	32. 2 Pullets.
POLISH, . . . . .	33. Cock.	34. 2 Hens.
	35. Cockerel.	36. 2 Pullets.
GAME— <i>Black or Brown</i> {	37. Cock.	38. 1 Hen.
Reds, . . . . . {	39. Cockerel.	40. 1 Pullet.
GAME— <i>Duckwings</i> , or {	41. Cock.	42. 1 Hen.
any other variety, . . . . . {	43. Cockerel.	44. 1 Pullet.
BANTAMS— <i>Game</i> , . . . . .	45. Cock.	46. 1 Hen.
	47. Cockerel.	48. 1 Pullet.

POULTRY— <i>continued.</i>		
	<i>Section.</i>	<i>Section.</i>
BANTAMS— <i>Sebright</i> , . . .	49. Cock.	50. 2 Hens.
	51. Cockerel.	52. 2 Pullets.
BANTAMS— <i>Any other Variety</i> , . . .	53. Cock.	54. 2 Hens.
	55. Cockerel.	56. 2 Pullets.
ANY OTHER PURE BREED OF POULTRY, . . .	57. Cock.	58. 2 Hens.
	59. Cockerel.	60. 2 Pullets.
DUCKS— <i>White Aylesbury</i> , . . .	61. Drake.	62. 2 Ducks.
	63. Drake (Young).	64. 2 Ducklings.
DUCKS— <i>Rouen</i> , . . .	65. Drake.	66. 2 Ducks.
	67. Drake (Young).	68. 2 Ducklings.
DUCKS— <i>Any other Pure Breed</i> , . . .	69. Drake.	70. 2 Ducks.
	71. Drake (Young).	72. 2 Ducklings.
TURKEYS— <i>Black Norfolk</i> , . . .	73. Cock.	74. 2 Hens.
	75. Cock (Poult).	76. 2 Hens (Poults).
TURKEYS— <i>Any other Breed</i> , . . .	77. Cock.	78. 2 Hens.
	79. Cock (Poult).	80. 2 Hens (Poults).
GEESE— <i>Grey Toulouse</i> , . . .	81. Gander.	82. 2 Geese.
	83. Gander (Young).	84. 2 Goslings.
GEESE— <i>Emden</i> , . . .	85. Gander.	86. 2 Geese.
	87. Gander (Young).	88. 2 Goslings.
GEESE— <i>Any other Pure Breed</i> , . . .	89. Gander.	90. 2 Geese.
	91. Gander (Young).	92. 2 Goslings.
Total amount of Poultry Premiums, £138.		

## CLASS VI.—DAIRY PRODUCE.

SECTION	BUTTER.	
1. Best Sample of Cured,	. . . . .	£6
Second best,	. . . . .	4
Third best,	. . . . .	2
Fourth best (Reserve Number),	. . . . .	...
2. Best Sample of Powdered,	. . . . .	6
Second best,	. . . . .	4
Third best,	. . . . .	2
Fourth best (Reserve Number),	. . . . .	...
3. Best Sample of Fresh,	. . . . .	6
Second best,	. . . . .	4
Third best,	. . . . .	2
Fourth best (Reserve Number),	. . . . .	...
		£36
CHEESE.		
4. Best Two, Cheddar variety,	. . . . .	£6
Second best,	. . . . .	4
Third best,	. . . . .	2
Fourth best (Reserve Number),	. . . . .	...
Carry forward,		£12
		£36

SECTION	Brought forward,	£12	£36
5. Best Two, Dunlop variety.	.	6	
Second best,	.	4	
Third best,	.	2	
Fourth best (Reserve Number),	.	...	
6. Best Two Sweet Milk, any other variety,	.	6	
Second best,	.	4	
Third best,	.	2	
Fourth best (Reserve Number),	.	...	
			36
			£72

## CLASS VII.—IMPLEMENTS, &c.

NOTE.—*Under Implements are included those for Agriculture, Horticulture, and Forestry.*

Special Premiums will be awarded on the Report by the Implement Committee for

1. Machines for Thinning Turnips.
2. Machines for Spreading Manure.

Reference is made to the General Regulations for the terms on which other Implements may be exhibited, and the conditions under which they will be tried and rewarded.

The Inspecting Committee are authorised to award Silver Medals for Inventions, Improvements, or General Agricultural Collections, and to recommend Implements for trial.

In addition, it is competent for the Local Committee to select any description of Implement they think proper for special trial. See Rule 63.

Collections of Articles not Agricultural will be received for exhibition, but such Collections will not be inspected by the Judges. See Rule 64.

### ABSTRACT OF PREMIUMS.

1. Cattle,	.	.	.	£991	0	0
2. Horses,	.	.	.	702	0	0
3. Sheep,	.	.	.	384	0	0
4. Swine,	.	.	.	93	0	0
5. Poultry,	.	.	.	138	0	0
6. Dairy Produce,	.	.	.	72	0	0
7. Medium Gold Medals to former Prize Animals, say	.	.	.	160	0	0
8. Six Silver Medals to Breeders of best Aged Bulls and best Stallion,	.	.	.	4	16	0
9. Extra Stock, say	.	.	.	40	0	0
10. Implements, say	.	.	.	80	0	0
				£2664	16	0

## REGULATIONS.

## GENERAL CONDITIONS.

1. Members of the Society are admitted to the Show-Yard without payment, on exhibiting a "*Member's Ticket*." Tickets will be sent to all Members residing in the Counties connected with the Show—Lanark, Ayr, Argyll, Renfrew, and Bute. Members residing in other localities must apply for Tickets at the Secretary's Office, 3 George IV. Bridge, Edinburgh, *not later than the 17th of July*.

2. No animal to be allowed to compete in more than one section, except Horses in the following sections, namely, 15, 16, 17, 21, and 22, which may also enter in section 19.

3. All animals must be entered in the section applicable to their ages, and cannot be withdrawn after entry.

4. Stock must be *bona fide the property and in the possession of* the Exhibitor from the 9th June (the last day of Entry).

5. The schedule of Entry must be filled up so far as within the knowledge of the Exhibitor.

6. Breeding Stock must not be shown in an improper state of fatness, and the Judges will be prohibited from awarding Premiums to overfed animals.

7. The Competition of Thorough-bred Stallions will take place at Glasgow on Tuesday, the 23d of February, and will be for this year under the management of the Glasgow Agricultural Society. Entries to be made with Mr John Dykes, jun., 79 St Vincent Street, Glasgow, on or before 17th February 1875.

8. No animal shall bear on its rug, harness, pail, or other fittings, any initial, crest, or mark of ownership, nor be distinguished otherwise than by the number indicating its place in the Catalogue.

9. Any artificial contrivance or device of any description found on an animal either for preventing the flow of milk or for any other purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal will be prohibited from again entering stock for any of the Society's General Shows.

10. No animal to be taken out of its stall after 10 A.M. during the Show, except by order of the Judges, or with permission of the Secretary. Those infringing this Rule will be fined 10s.

11. Aged Bulls and Stallions must have had produce, and, along with Two-year-old Bulls and Three-year-old Colts, have served within the year of the Show.

12. All Cows must have had calves previous to the Show, and when exhibited, they must either be in milk or in calf; if in milk, birth must have been within 9 months of the Show; if in calf, birth must be certified within 9 months after the Show. In the case of Ayrshire Heifers in Calf, calved before 1st January 1873, birth must be certified within 9 months after the Show.

13. All Milch Cows must have been milked dry the evening previous to being judged, and they must, while within the Show-Yard, be milked morning and evening. The Judges will be instructed to withhold the prizes from any animals overstrained or suffering from want of being milked.

14. Two-year-old Heifers—of the Short-horn and Polled Breeds—must be in calf when exhibited, and the premiums will be withheld till birth be certified, which must be within 9 months after the Show.

15. Mares in Sections 5 and 14 must have produced foals after 1st January 1875, and foals must be at foot, except when death can be proved. Mares in Section 6 must be in foal, and awards will be suspended till birth is certified, which must be within 11 months from the date of the Show.

16. With reference to regulations 12 and 14, birth of at least a seven months' calf must be certified; and in regard to regulation 15, birth of at least a nine months' foal.

17. Horses entered as suitable for Field are expected to be jumped in the Horse Ring, but this is not compulsory except when the animals are being judged, and then only if required by the Judges. Those entered for leaping must be jumped in the Horse Ring at each Horse Parade during the Show, and the Prize will not be declared till after the last Parade on Friday.

18. The inspection of Horses as to soundness is left entirely to the Judges, who may consult the Society's Veterinary Surgeon if they deem it expedient.

19. No protests on veterinary grounds will be received.

20. All Ewes must have reared Lambs in 1875; and Ewes in Sections 3 and 7 (Cheviot and Blackfaced) must be in milk, and have their Lambs at foot. Fleeces must not be artificially coloured.

21. Sows must have reared pigs in 1875, or be in pig; and Pigs must belong to the same litter, and be uncut.

22. In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, 1875. In the sections for Hens and Pullets of the Game and Malay Breeds, the lots to consist of one bird only.

23. An animal which has gained a first premium at a General Show of the Society cannot again compete in the same section.

24. First prize animals in the classes of Aged Bulls, Cows, Stallions, and Mares may be shown for the Medium Gold Medal at two consecutive Shows after gaining the first prize.

25. Commendations will be given for extra Stock only.

26. Should it be proved to the satisfaction of the Directors that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Directors or Judges as to its qualification or properties, the case shall be reported to the first General Meeting, in order that the Exhibitor shall be disqualified from again competing at the Society's Shows, and his name, if he be a Member, struck from the roll.

27. When an animal has previously been disqualified by the decision of any Agricultural Association in Great Britain or Ireland, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity.

28. The violation by an Exhibitor of any one of the Regulations will involve the forfeiture of all Premiums awarded to him.

29. Protests against the awards of the Judges must be lodged with the Secretary not later than 9 A.M. on Wednesday, 28th July, and parties must be in attendance at the Committee-Room, in the Show-Yard, at 10 A.M. that day, when protests will be disposed of.

30. Protests lodged for causes which the protestor produces no good evidence to substantiate, will render him liable to be reported to the Board of Directors, with the view, if they see reason, to his being prohibited from again entering stock for a General Show.

31. The Society shall not be liable for any loss or damage which Stock, Implements, or other articles may sustain at the Show, or in consequence of having been sent to it.

32. The decisions of the Board of Directors are final in all questions respecting Premiums, and it shall not be competent for any Exhibitor to appeal against such decisions to, nor seek redress in respect of them from, any other tribunal.

33. The Premiums awarded will be paid in November 1875, and, with the exception of Silver Medals, may be taken either in money or in plate.

#### CERTIFICATES OF ENTRY.

34. Every Lot must be intimated by a Certificate of Entry, lodged with the

Secretary *not later than Wednesday, the 9th of June.* Printed forms will be issued on application to the Secretary, No. 3 George IV. Bridge, Edinburgh.

#### ADMISSION OF STOCK.

35. The Yard will be open for Stock on Monday, 26th July, and between Six and Twelve o'clock on the morning of Tuesday, 27th, after which hour no Stock can be admitted.

36. One Servant will be admitted in charge of each Lot. Bulls must be secured by a nose ring, with chain or rope attached, or with strong halters and double ropes, with a man on each side.

37. Servants in charge of Stock must bring their own buckets or pails, and a piece of rope to carry their forage. Covered accommodation will be erected for the whole of the Stock. Straw, hay, grass, and tares will be provided free by the Society during the four days of the Show; other kinds of food will be supplied at fixed prices in the forage yard. Any Servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not grass, tares, hay, nor straw.

38. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule will be detained till all the other Stock is removed.

39. Cattle, Sheep, or Swine cannot be removed from the Yard till 5 p.m. on Friday, 30th July, except on certificate by the Veterinary Surgeon employed by the Directors.

40. Horses may be withdrawn at 6 each evening on a deposit of £2 for each animal, which shall be forfeited if the animal is not brought back at Half-past 7 o'clock the following morning. Those not in before 8 will forfeit 10s.

41. Smoking is strictly prohibited in the sheds, stables, and horse-ring gallery, and no lights allowed at night. Those infringing this Rule will be fined 10s.

#### JUDGING STOCK.

42. On Tuesday, 27th July, Exhibitors, and all others except Servants in charge of Stock, must leave the Yard at 12 noon. The Judges will commence their inspection at 1 p.m., when the public will be admitted. There shall be no award unless the Judges deem the animals to have sufficient merit, more especially if there is only one lot in a Section; and it shall be in their power to suggest the removal of any lot which appears to them unworthy of being placed in the Yard.

43. Two Members of Committee will attend each Section of the Judges. It will be their duty to see that no obstruction is offered to them, and that the space reserved for them is not encroached on; to communicate to the Secretary any question that may arise for the consideration of the Committee; to complete their reports; and to ticket the prize animals.

44. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or Attending Member in any class in which he is competing; and no Exhibitor shall remain in charge of any lot, whether belonging to himself or another, while the Judges are in the Yard.

#### PLACING AND JUDGING POULTRY.

45. Poultry must be brought to the Show-Yard on Monday, 26th July, or between 6 and 12 o'clock on the morning of Tuesday, 27th July. No lot will be admitted without an Admission-order. Coops, food, and attendance will be found by the Society.

46. The Judges will commence their inspection at 1 p.m. on Tuesday.

47. No lot to be removed from the Yard till 5 p.m. on Friday. The Society shall not be liable for any loss or accident sustained in transit or otherwise.

## PLACING AND JUDGING DAIRY PRODUCE.

48. Dairy Produce must be brought to the Show-Yard on Monday, 26th July, or between 6 and 12 on the morning of Tuesday, 27th. No lot will be admitted without an admission-order.

49. Samples of Cured and Powdered Butter not to be less than 14 lbs. Fresh Butter to be in three  $\frac{1}{2}$  lb. rolls. Dairy Produce must have been made on the Exhibitor's farm in 1875. At least 1 cwt. of the variety of Butter, and 2 cwt. of that of the Cheese exhibited, must have been made during the season. The lots shall be fair samples, and untasted.

50. The Judges will commence their inspection at 1 P.M. on Tuesday, 27th July.

51. No article to be removed from the Yard till 5 P.M. on Friday, 30th July.

## PLACING, INSPECTING, AND JUDGING IMPLEMENTS.

52. All articles must be entered with the Secretary on or before 9th June, and Exhibitors must intimate whether they wish their goods placed under cover or not, and specify the space they require. For Rates, see Stall Rent, page 20.

53. The Yard will be open for the reception of Implements on Tuesday, 20th July, and till 10 A.M. on Tuesday, 27th July.

54. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the Implement.

55. The carriage of all Implements must be prepaid.

56. The articles of each Exhibitor will be all placed in one stand.

57. No Steam Engine shall be driven in the Yard at a greater speed than 6 miles an hour.

58. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Secretary, and must not leave the Yard at the close of the Show till 5.30 P.M.

59. All Machines requiring steam or fire must be entered as such in the Certificate, and will be placed in the Motion Yard. Coke must be used in all cases where fire is required.

60. The Inspecting Committee will award such Silver Medals as they may deem proper for Inventions, Improvements, or General Agricultural Collections, or recommend Implements for trial.

61. If an Exhibitor has already received a Premium from the Society he shall not receive a second award for the same invention or implement.

62. When an Implement or Machine is supposed to embrace a new invention, or improvement, the nature of such must be specified in the entry. When a trial is recommended by the Inspecting Committee, such trial will be instituted in a convenient locality, and at a season of the year suitable for the operation of the implement or machine, which, when thoroughly tested, will be entitled to such a Premium as the Directors may see fit to award, on the report of the Judges employed by them.

63. In addition, it is competent for the Local Committee to select any description of Implement they think proper for special trial. Such trial shall be conducted by the Local Committee, who shall undertake the whole arrangements for carrying out the same at a period of the year they consider suitable. The Directors shall award such Money Prizes or Medals on account of the Competitive Trials as may be arranged with the Local Committee.

64. Collections of Articles not Agricultural will be received for Exhibition, but such Collections will not be inspected by the Judges.

65. All articles must remain in the Yard till 5 P.M. on Friday, the 30th July, and may be kept there till the afternoon of Saturday.

## STALL RENT.

Closed-in stables will be provided for all the horses, and covered accommodation for the whole of the other stock. Night accommodation will be provided for Attendants on Stock, and those requiring the same must make application when they return their Entry Schedules, and remit the charge along with their stall rent. The following rates shall be paid by Exhibitors when making their Entries:—

	Members		Non-Members	
	s.	d.	s.	d.
Cattle, . . . . .	10	0	20	0
Stallions—3 and 2 year old entire Colts, . . . . .	20	0	30	0
All other Horses, . . . . .	15	0	25	0
Sheep and Swine, per pen, . . . . .	8	0	15	0
Night accommodation for Attendants, each, . . . . .	12	0	15	0
Poultry, each entry, . . . . .	2	0	3	0
Dairy Produce, each entry, . . . . .	2	0	3	0
Implement Shedding, 20 feet deep, per foot, . . . . .	2	0	3	0
Implements without Shedding, do., per foot, . . . . .	Free*		1	0

No smaller space than 6 feet frontage can be allowed for Implements.

\* The extent of open space given free to Implement Exhibitors who are Members of the Society is limited to 50 feet by 20; for additional space the charge is 1s. per foot.

Covered Booths for Offices can be had from £3, 10s. to Members, and £5 to Non-Members, according to size. Intimation to be made to the Secretary before the 1st of July.

## ADMISSION-ORDERS.

Admission-Orders will be forwarded to Exhibitors by post previous to the Show.

## ADMISSION OF PUBLIC.

The public will be admitted on Tuesday, 27th July, at 1 P.M., when the inspection by the Judges commences. Holders of Members' Tickets are admitted free; Exhibitors of Stock (not Members) will be charged 5s. for admission to the judging; all others 10s. The space reserved for the Judges will be enclosed by ropes, and no encroachment will be permitted.

Exhibitors of Implements and their attendants will be entitled to free entry during the Show, but must remain at their stalls during the judging of the stock on Tuesday.

On Wednesday, at 8 A.M., and throughout the Show, holders of Members' Tickets and Exhibitors will be admitted free.

The charges to others will be—Wednesday, from 8 A.M. till 5 P.M., 2s. 6d.; Thursday, from 8 A.M. till 1 P.M., 2s. 6d., after 1 o'clock, 1s.; Friday, from 8 A.M. till 12 noon, 1s., and from 12 till 5 P.M. 6d.

Placards are prohibited both inside the Show-Yard and on the outside of the Boundary Fence, with the exception of those belonging to Exhibitors, whose right is confined to their own stalls. No newspapers or any other article allowed to be carried about the Yard for sale. No strolling bands admitted.



Premium Lists, Regulations, and Certificates of Entry, may be obtained by applying at the Secretary's Office, No. 3 George IV. Bridge, Edinburgh.

*All Communications should be addressed to FLETCHER NORTON MENZIES, Esq., Secretary of the Highland and Agricultural Society of Scotland, No. 3 George IV. Bridge, Edinburgh.*

### LAST DAY OF ENTRY—WEDNESDAY, 9TH JUNE.

#### RAILWAY ARRANGEMENTS

##### IN ACCORDANCE WITH CLEARING-HOUSE REGULATIONS.

1. Stock and implements to the Show to be charged full rates.
2. From the Show, if sold, full rates.
3. From the Show, if unsold, to be conveyed at *half rates* back to the station whence they were sent, on production of a certificate from the Secretary of the Agricultural Show to the effect that they are really unsold.
4. All the above to be carried at owners' risk.
5. When agricultural machines and implements are carried under these regulations to and from shows, they must be invoiced station to station at the ordinary rates. Collection and delivery at sending station, and delivery to, or collection from, the Show-Yard to be performed by, or at the expense of the owners.
6. Regulations Nos. 1, 2, and 3, as to Cattle and Horses, to apply only if the traffic be conveyed in Cattle Waggon and by Goods Trains.
7. Poultry and Dogs to be charged full rates both ways.
8. No reduction in the ordinary rates for Horses or Cattle when conveyed in Horse-boxes.
9. Parties requiring the exclusive use of a Horse-box for only one animal to be charged one fare and a half.

The North British, the Glasgow and South-Western, the Highland, and Great North of Scotland Railway Companies have adopted the above Clearing-House Regulations.

##### SPECIAL ARRANGEMENTS.

##### *Caledonian Railway Company's Regulations.*

1. Stock and implements to the Show to be charged full rates.
2. From the Show, if sold, full rates.
3. From the Show, if unsold, to be conveyed back at one-half the ordinary charge to the station whence they were sent, on production of a certificate from the Secretary of the Show to the effect that they are really unsold.
4. Regulation No. 3, as regards Cattle and Horses, applies only if the traffic is conveyed in Cattle Waggon and by Goods Train, there being no reduction in the ordinary rates when it is conveyed in Horse-boxes or by Passenger Trains.
5. Parties requiring the exclusive use of a Horse-box for only one animal to be charged one fare and a half.
6. Poultry and Dogs to be charged full rates both ways.
7. All the above to be carried at owners' risk.
8. Collection and delivery to be performed in all cases by the owners.

## GENERAL SHOW OF STOCK AND IMPLEMENTS

At ABERDEEN, 1876.

The District connected with the Show comprises the Counties of Aberdeen, Banff, and Kincardine, and Eastern Division of Forfarshire.

*Premiums will be offered for the following Classes :—*

## CATTLE.

## SHORT-HORN.

Bulls calved before 1st January.....	1874
Bulls calved after 1st January .....	1874
Bulls calved after 1st January .....	1875
Cows of any age.	
Heifers, with own calf at foot, calved after 1st January.....	1874
Heifers calved after 1st January .....	1874
Heifers calved after 1st January .....	1875

## POLLED ANGUS OR ABERDEEN.

Bulls calved before 1st January.....	1874
Bulls calved after 1st January .....	1874
Bulls calved after 1st January .....	1875
Cows of any age.	
Heifers, with own calf at foot, calved after 1st January.....	1874
Heifers calved after 1st January .....	1874
Heifers calved after 1st January .....	1875

## GALLOWAY.

Bulls calved before 1st January.....	1874
Bulls calved after 1st January .....	1874
Bulls calved after 1st January .....	1875
Cows of any age.	
Heifers calved after 1st January .....	1874
Heifers calved after 1st January .....	1875

## AYRSHIRE.

Bulls calved before 1st January.....	1874
Bulls calved after 1st January .....	1874
Bulls calved after 1st January .....	1875
Cows in milk of any age.	
Cows in calf of any age, or Heifers in calf calved before 1st January	1874
Heifers calved after 1st January .....	1874
Heifers calved after 1st January .....	1875

## HIGHLAND.

Bulls calved before 1st January .....	1873
Bulls calved after 1st January .....	1873
Bulls calved after 1st January .....	1874
Cows of any age.	
Heifers calved after 1st January .....	1873
Heifers calved after 1st January .....	1874

## FAT STOCK.

Highland Oxen calved after 1st January .....	1872
Highland Oxen calved after 1st January .....	1873
Polled Oxen calved after 1st January .....	1873
Polled Oxen calved after 1st January .....	1874
Oxen of any other pure or cross breed calved after 1st January	1873
Oxen of any other pure or cross breed calved after 1st January	1874
Cross-bred Heifers calved after 1st January.....	1873
Cross-bred Heifers calved after 1st January.....	1874

## HORSES

*For Agricultural Purposes.*

Stallions foaled before 1st January.....	1873
Entire Colts foaled after 1st January .....	1873
Entire Colts foaled after 1st January .....	1874
Entire Colts foaled after 1st January .....	1875
Mares with foal at foot, foaled before 1st January.....	1873
Mares in foal, foaled before 1st January .....	1873
Fillies foaled after 1st January.....	1873
Fillies foaled after 1st January.....	1874
Fillies foaled after 1st January.....	1875
Draught Geldings foaled before 1st January .....	1873
Draught Geldings foaled after 1st January .....	1873

## THOROUGH-BRED STALLIONS.

Thorough-bred Stallions to serve in the District of the Show in Season 1876. To be shown at Aberdeen in Spring 1876.

## HUNTERS AND ROADSTERS.

Mares or Geldings, suitable for field, foaled before 1st January...1872  
 Mares or Geldings, suitable for carriage, foaled before 1st January 1872  
 Mares or Geldings, suitable as Hackneys or Roadsters, between 14 and 15 hands high.

## PONIES.

Highland Stallions under 14½ hands high.  
 Highland Mares or Geldings between 13 and 14½ hands high.  
 Mares or Geldings between 13 and 14 hands high.  
 Mares or Geldings between 12 and 13 hands high.  
 Mares or Geldings, 12 hands and under.

## S H E E P.

*Ewes, Gimmers, Wethers, and Hoggs to be exhibited in pens of five.*

### CHEVIOT.

Tups above one shear.  
Dinmont or Shearling Tups.  
Ewes above one shear.  
Shearling Ewes or Gimmers.

### BLACKFACED.

Tups above one shear.  
Dinmont or Shearling Tups.  
Ewes above one shear.  
Shearling Ewes or Gimmers.

### BORDER LEICESTER.

Tups above one shear.  
Dinmont or Shearling Tups.  
Ewes above one shear.  
Shearling Ewes or Gimmers.

### LEICESTER.

Tups of any age.  
Ewes of any age, or Gimmers.

### COTSWOLD.

Tups of any age.  
Ewes of any age, or Gimmers. '

### LINCOLN.

Tups of any age.  
Ewes of any age, or Gimmers.

### SOUTHDOWN.

Tups of any age.  
Ewes of any age, or Gimmers.

### SHROPSHIRE.

Tups of any age.  
Ewes of any age, or Gimmers.

### EXTRA SHEEP.

Cheviot Wethers not above three shear.  
Blackfaced Wethers not above four shear.  
Wether Hoggs of any cross not above one shear.

*Sheep not included in the above Classes must be entered as Extra Stock.*

## SWINE.

*Pigs to be exhibited in pens of three.*

### LARGE BREED.

Boars.

Sows.

Pigs not above 8 months old.

### BERKSHIRE.

Boars.

Sows.

Pigs not above 8 months old.

### SMALL BREED.

Boars.

Sows.

Pigs not above 8 months old.

## POULTRY.

To be shown in Pens of One Cock or Cockerel and Two Hens or Pullets of each of the following breeds, except in the sections for Hens and Pullets of the Game and Malay Breeds, where only one bird is required:—

Dorking—Silver-Grey.

Dorking—Coloured.

Cochin-China.

Brahmapootra.

Spanish.

Scotch Grey.

Hamburg—Pencilled.

Hamburg—Spangled.

Polish.

Game—Black or Brown Reds.

Game—Duckwings, or any other variety.

Bantams—Game.

Bantams—Selbright.

Bantams—Any other variety.

Any other pure Breed of Poultry

Ducks—White Aylesbury.

Ducks—Rouen.

Ducks—Any other pure Breed.

Turkeys—Black Norfolk.

Turkeys—Any other Breed.

Geese—Grey Toulouse.

Geese—Emden.

Geese—Any other pure Breed.

F. N. MENZIES, *Secretary.*

J. GEORGE IV. BRIDGE, EDINBURGH,

31 May 1875.



APPENDIX (C).

LIST OF MEMBERS

OF

THE HIGHLAND AND AGRICULTURAL  
SOCIETY OF SCOTLAND,

1875,

ALPHABETICALLY ARRANGED, AND DISTINGUISHING  
THE YEAR OF ADMISSION.

By the Charter of 1834 the Society consists of two classes, Ordinary and Honorary or Corresponding Members. The number of Honorary or Corresponding Members resident in the United Kingdom must not exceed twenty, but with power to the Society to elect as Honorary Associates persons resident abroad, not subjects of Her Majesty, who may have been benefactors to the Society, or who are distinguished for their skill in Art or Science, provided that the number of such Foreign Associates shall not exceed twenty.

By a Bye-Law passed in 1873, with reference to the Supplementary Charter of 1856, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected free Life Members of the Society.

Candidates must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June. It is not necessary that the Member who proposes the Candidate should attend the Meeting.

The ordinary subscription is £1, 3s. 6d. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £12, 12s. to £7, 1s. Proprietors farming the whole of their own lands, whose assessment on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Office-Bearers of Local Agricultural Associations, Resident Agricultural Factors, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment, varying, according to the number of previous annual payments, from £5, 5s. to £3.

According to the Charter, a Member who homologates his Election by paying his first subscription cannot retire until he has paid, in annual subscriptions, or otherwise, an amount equivalent to a life composition.

Members of the Society receive the Transactions on application, and are entitled to apply for District Premiums—to report Ploughing Matches for the Medal—to attend Shows free of charge, and to exhibit Stock at reduced rates.

Members having Candidates to propose are requested to send their names to FLETCHER NORTON MENZIES, Esq., No. 3 George IV. Bridge, Edinburgh.

The Members marked \* have been Presidents; and † Vice-Presidents



## LIST OF MEMBERS.

Her Most Gracious Majesty THE QUEEN.

\*His Royal Highness The PRINCE OF WALES, *President of the Society.*

Admitted

1872

1873

Admitted

- 1833 ARERCORN. His Grace the Duke of, K.G., Chesterfield House, London  
 1862 ABERCROMBY, Right Hon. Lord, Airthrey Castle, Stirling  
 1873 ABERCROMBY, Sir Robert John, of Birkenbog, Bart., Forglen, Turriff  
 1868 ABERDEEN, Right Hon. the Earl of, Haddo House, Methlic  
 1872 ABERNETHY, Peter, Halls, Penicuik  
 1865 ABINGER, Right Hon. Lord, Inverloch Castle, Kingussie  
 1859 Adam, Alex. F., W.S., Edinburgh  
 1855 Adam, Æneas, Humbertson, Dingwall  
 1842 Adam, James, S.S.C., Edinburgh  
 1860 Adam, John, Closeburn, Thornhill  
 1856 Adam, Stephen, Wool-Merchant, 11 Hillside Crescent, Edinburgh  
 1874 Adam, Thomas, of Lynegar, Bank Agent, Wick  
 1853 ADAM, The Right Hon. W. Patrick, of Blair-Adam, M.P.  
 1872 Adamson, Henry D., Balquharn, Alford  
 1859 Adamson, S., of Drumclyre, Dumfries  
 1874 Addie, Gavin, Viewpark, Uddingston  
 1859 Adie, Alexander James, Linlithgow  
 1850 AGNEW, Sir Andrew, of Lochnew, Bart., Stranraer  
 1843 Agnew, R. Vans, of Sheuchan and Barnbarroch, M.P., Wigtown  
 1857 Aikman, Thomson, Glasgow  
 1864 Ainslie, Daniel (of the Gart, Callander), 48 Moray Place, Edinburgh  
 1859 Ainslie, David, of Costerton, Blackshields  
 1848 Ainslie, J., Hillend, Pentland, Loanhead  
 1853 Ainslie, R., of Elvingston, Gladsmuir  
 1852 AINSLIE, Right Hon. the Earl of, K.T., Cortachy Castle, Kirriemuir  
 1852 AITCHISON, Gen. Sir J., K.C.B., G.C.B., London  
 1874 Aitchison, James, 23 Princes Street, Edinburgh

Admitted

- 1851 Aitchison, James (late Proncy Mains, Dornoch), Australia  
 1865 Aitchison, Lieut.-Col., of Drummore, Musselburgh  
 1870 Aitchison, Peter, West Garleton, Haddington  
 1863 Aitchison, W., Linhope, Hawick  
 1861 Aitken, George, Tyrie, Kirkcaldy  
 1857 Aitken, James, 2 Claremont Terrace, Glasgow  
 1854 Aitken, James, Markle, Prestonkirk  
 1864 Aitken, John Gillespie, Southfield, Stirling  
 1857 Aitken, Robt., Drumore, Campbeltown  
 1869 Aitken, Robert, Kilmany, Cupar Fife  
 1860 Aitken, Thomas, 5 Grosvenor Crescent, Edinburgh  
 1854 Aitken, Thomas, Listonshields, Balerno  
 1870 Alexander, Archd., Merchant, West Linton  
 1872 Alexander, Charles, Easter Knowe, Stobo  
 1856 Alexander, C., Whitefield, West Linton  
 1861 Alexander, Lt.-Col. C., of Ballochmyle, M.P., Mauchline  
 1872 Alexander, George, Easter Lilliesleaf, St Boswells  
 1831 ALEXANDER, Sir J. Edward, C.B., of Westerton, Bridge-of-Allan  
 1857 Alexander, James, Seed Merchant, 1 Waterloo Place, Edinburgh  
 1870 Alexander, James, of Balmule, Dunfermline  
 1855 Alexander, John, Broughty Ferry  
 1872 Alexander, John, Broxburn Hall, Broxburn  
 1865 Alexander, Capt. John, of Southbar, R.N., C.B., Paisley  
 1861 Alexander, Thos., Corn Factor, Perth  
 1853 Alexander, Wm., Bent of Haulkerton, Laurencekirk  
 1873 Alexander, William, Loanside, Clackmannan

## Admitted

- 1865 Alison, James, M., Redcastle, Inverness  
 1833 Allan, Alexander, Advocate, 5 Hillside Crescent, Edinburgh  
 1861 Allan, Alex., Kinnon Park, Methven, Perth  
 1864 Allan, Alexander, Carbars, Wishaw  
 1867 Allan, Andrew, Munnoch, Dalry, Ayr  
 1847 Allan, Lient-Colonel, Edinburgh  
 1874 Allan, James, Corn Merchant, Borrowstonness  
 1851 Allan, James, Gogar Mains, Corstorphine  
 1855 Allan, James, Claulands, Lamlash  
 1870 Allan, Jas., jun., Balnacole, Brodick, Arran  
 1852 Allan, James, West Mains, Stonehouse  
 1863 Allan, James D., Culthill, Dunkeld  
 1854 Allan, John, Billie Mains, Ayton  
 1861 Allan, John, Crieffvechter, Crieff  
 1870 Allan, John, of Larg, Bankend House, Cumnock  
 1873 Allan, John, Redheugh, Cockburnspath  
 1863 Allan, Richard, Howden, Jedburgh  
 1863 Allan, Robert A., Eyemouth  
 1832 Allan, T. W. M., of Glenfeochan, Oban  
 1874 Allan, William, Clury, Grantown  
 1870 Allan, William, Drummondreoch, Ferintosh  
 1871 Allan, William, Park, Clackmannan  
 1830 Allan, William, Edinburgh  
 1815 Allen, James, Merchant, Glasgow  
 1873 Alston, David, Hyndford Wells, West Linton  
 1864 Alston, Geo., of Craighead, Hamilton  
 1850 Alston, Jn. P., of Muirburn, Strathaven  
 1863 Amos, Thomas, Earlside, Hawick  
 1838 ANDERSON, Sir Alexander, Aberdeen  
 1874 Anderson, Alexander, Berryhill, Dundee  
 1866 Anderson, B. T. G., of Tushielaw, Selkirk  
 1873 Anderson, Arthur, M.D., C.B., Sunnyside, Pitlochry  
 1825 Anderson, D., of Moredun, 24 Moray Place, Edinburgh  
 1872 Anderson, Findlay, of Inchyra Grange, Polmont  
 1839 Anderson, George, late Solicitor, Inverness  
 1862 Anderson, Geo., of Woodhouse, Ecclefechan  
 1863 Anderson, George, Broomhill, Selkirk  
 1859 Anderson, George B., Meikle Pinkerton, Dunbar  
 1837 Anderson, Henry, of Chapel, Kirkcaldy  
 1861 Anderson, Henry, Burnside, Stanley

## Admitted

- 1873 Anderson, James, Feorline, Strachur, Inveraray  
 1839 Anderson, J., late of Gorthlick, Inverness  
 1863 Anderson, James, Newbigging, Dundee  
 1865 Anderson, James, Solicitor, Inverness  
 1871 Anderson, John, Airies, Kirkcinner  
 1873 Anderson, John, Chapel, Moffat  
 1838 Anderson, John, Merchant, London  
 1838 Anderson, John, Merchant, Glasgow  
 1857 Anderson, John, Craigton, Banchoory  
 1868 Anderson, John, Mill of Wester Coull, Tarland  
 1857 Anderson, John, Pratis, Kennoway  
 1859 Anderson, John, Smithstown, Croy, Kilsyth  
 1873 Anderson, John, Strachernmore, Inveraray  
 1871 Anderson, John A., St Albans, Perth  
 1870 Anderson, John S. (of Whiteside, Dumfries), Dalhousie Mains, Dalkeith  
 1851 Anderson, Lawrence, Northfield Cottage, Liberton  
 1864 Anderson, Peter, Gillespie, Glenluce  
 1870 Anderson, Robert, Alleyford, Kirkgunzeon, Dumfries  
 1856 Anderson, Robert, of Lochdhu, Nairn  
 1871 Anderson, Robert, Middlebank, Errol  
 1861 Anderson, Robt. H., Burleigh, Milnathort  
 1850 Anderson, Robert Hood, Glasgow  
 1858 Anderson, Robt. Wm., Clerk of Supply, Forfar  
 1849 Anderson, Stephen, Bridge of Allan  
 1832 Anderson, Thomas, of Glendrisaig, Lainshaw House, Kilmarnock  
 1854 Anderson, T. Scott, W.S., 10 Norfolk Crescent, Hyde Park, London, W.  
 1865 Anderson, William, Ballimore, Tighna-bruaich  
 1867 Anderson, W. H., Clifton Villa, Anstruther  
 1857 Anderson, William, Hattonburn, Banchoory  
 1873 Anderson, William, Norton Mains, Ratho  
 1870 Anderson, William, Cafe Royal Hotel, Edinburgh  
 1840 Anderson, William James, late of Techmuiry  
 1857 Andrew, Hugh, Keprigan, Campbelltown  
 1873 Andrew, Robert, Allens, Inchinnan, Paisley  
 1870 Andrew, William J., Banker, Coatbridge  
 1874 Andrews, John, Park, Nairn  
 1863 Angus, John, Whitefield, Morpeth  
 1871 Annan, David, The Torr, Moonzie, Cupar Fife

Admitted

- 1868 Annand, John, Hotel, Inverurie  
 1872 ANSTRUTHER, Sir W. C. J. C., of Anstruther, Bart., M.P., Cormiston Towers, Biggar  
 1862 ANSTRUTHER, Sir Robert, of Balcaskie, Bart., M.P., Pittenweem  
 1844 Arbuthnot, Geo. Clerk, of Mavisbank, Loanhead  
 1833 ARBUTHNOTT, Right Hon. Viscount, Arbuthnott House, Fordoun  
 1864 ARBUTHNOTT, Hon. Mrs. Inchmartine  
 1873 ARBUTHNOTT, Hon. The Master of, Arbuthnott House, Fordoun  
 1855 Archibald, Thomas, of Viewbank, Lasswade  
 1864 Archer, Thos., late Ramly Lodge, Lymington, Hants  
 1869 Archibald, James, Glengelt, Lauder  
 1861 Archibald, James, Jamestown House, Monasterewan, Co. Kildare, Ireland  
 1849 Archibald, John, Cockburn, Dunse  
 1869 Archibald, John, jun., Duddingston, South Queensferry  
 1853 ARDMILLAN, Hon. Lord, 18 Charlotte Square, Edinburgh  
 1844<sup>a</sup> ARGYLL, His Grace the Duke of, K.T., Inveraray Castle, Inveraray  
 1853 Arklay, John, Gorthlick, Inverness  
 1861 Arklay, Robert, of Ethiebeaton, Dundee  
 1850 Arkley, R. H., Dun House, Montrose  
 1854 Armour, Alex. B., Meiklehill, Kirkin-tilloch  
 1862 Arnot, David, Adamston, Auchterhouse  
 1871 Arnot, William, Glamis Mains, Glamis  
 1865 Arnot, Thomas R., Ramshill, Harlesden Green, London  
 1862 Arras, Walter, Fodderty, Dingwall  
 1874 Arres, James Mather, Arderseir Mains, Arderseir  
 1865 Arres, Wm., Wester Delnies, Nairn  
 1858 Arundell, W. F. H., of Barjarg, Dumfries  
 1873 Ashdown, A. H., Uppington, Salop—  
*Free Life Member*  
 1874 Asher, William G. C., Belmaduthy, Munloch  
 1845 Askew, Henry Wm., Conishead Priory, Ulverston  
 1863 Askew, W., of Pallinsburn, Coldstream  
 1860 ATHOLE, His Grace the Duke of, K.T., Blair Castle, Blair Athole  
 1841 ATHOLE, Her Grace the Duchess-Dowager of, Dunkeld  
 1874 Auld, Alexander, Newton, Rothmaise, Inch  
 1851 Austin, R. S., late Middleton, Muthill  
 1873 AVELAND, Right Hon. Lord, Norman-ton Park, Oakham, Rutlandshire  
 1875 Aveling, Thomas, Rochester, Kent

Admitted

- 1849 Aytoun, James, Advocate, London  
 1844 Aytoun, Roger S., of Inchdairnie, Kirk-caldy  
 1824 Baillie, Evan, of Dochfour, Inverness  
 1839 BAILLIE, Right Hon. Henry James of Redcastle, Killearnan, Inverness  
 1851 Baillie, James William, of Culterallers, W.S., Biggar  
 1865 Baillie, John Menzies, C.A., 15 North-umberland Street, Edinburgh  
 1869 Baillie, John, Fullerton, Penicuik  
 1865 Baillie, John B., of Leys, Inverness  
 1847 BAILLIE, Sir William, of Polkemmet, Bart., Whitburn  
 1875 Bain, Daniel, Dunstaffnage, Oban  
 1875 BAIN, Hon. James, Lord Provost of Glasgow  
 1864 Bain, James, Banker, St Andrews  
 1873 Baird, Alex., of Urie, Stonehaven  
 1868 Baird, Arthur E., Croftenloan, Pit-lochry  
 1860 BAIRD, Sir David, of Newbyth, Bart. Prestcankirk  
 1843 BAIRD, Sir Jas. Gardiner, of Saughton Hall, Bart., Inch House, Liberton  
 1838 Baird, James, of Knoydart and Cam-busdoon, Ayr  
 1870 Baird, Jn., Hall, Kirkconnel, Sanquhar  
 1870 Baird, John, Solicitor, Lockerbie  
 1871 Baird, John, jun., Solicitor, Lockerbie  
 1873 Baird, Thomas, Hundleshope, Peebles  
 1873 Baird, Wm., of Elie, Fife  
 1844 Baird, Wm., Grain Merchant, Glasgow  
 1873 BALFOUR of Burleigh, Right Hon. Lord, Kennet House, Clackmannan  
 1863 Balfour, Arthur J., of Whittingham, Prestonkirk  
 1843 Balfour, Colonel David, of Balfour and Trenabie, Kirkwall  
 1857 Balfour, Major Francis W., of Fernie Castle, Ladybank  
 1842 Balfour, James, Letham, Leven  
 1839 Balfour, John, of Balbrynne, Markinch  
 1839 Balfour, John Hutton, M.D., Prof. of Botany, University of Edinburgh  
 1869 Balfour, John M., of Pilrig, W.S., Edinburgh  
 1873 Balfour, Cap. Robt. Fred., younger of Balbirnie, Markinch  
 1860 Ballantyne, John, jun., Seedsman, Dal-keith  
 1869 Ballautyne, Thomas, Netherton, East Kilbride  
 1870 Ballingal, And. H., W.S., Perth  
 1871 Ballingal, Neil, Sweetbank, Markinch  
 1859 Ballingal, William, Sweetbank, Mark-inch  
 1853 Ballingall, Robert, Island of Islay, Greenock

## Admitted

- 1857 Ballingall, D., Factor, Blairdrummond  
 1860 Ballingall, George, Clarilaw, St Boswells  
 1861 Ballingall, John, Dunbog, Newburgh  
 1863 Balmer, Thomas, Fochabers  
 1862 Bankes, Meyrick, of Letterewe, Dingwall  
 1858 BANNERMAN, Sir Alex., of Crimonmogate, Bart., Lonmay  
 1859 Barbour, G. F. (of Bonskeid, Pitlochry), 11 George Square, Edinburgh  
 1858 Barclay, Charles A., Aberdour House, Fraserburgh  
 1873 Barclay, David, Randerstone, Crail  
 1855 Barclay, George, Davochbeg, Golspie  
 1858 Barclay, George, Yonderton, Turrieff  
 1824 Barclay, George Robertson, late of Keavil, Dunfermline  
 1862 Barclay, J. W., M.P., 60 Dee Street, Aberdeen  
 1859 Barclay, Robert, Drums, Falkland  
 1855 Barclay, Thomas, Solicitor, Montrose  
 1865 Barclay, Thomas, Skelbo, Dornoch  
 1874 Barclay-Allardice, Robert, Jordanstone, Meigle  
 1839 Barker, Thomas, Sydney, Australia  
 1862 Barr, James, jun., Whiteshaw, Carlisle  
 1868 Barrie, James, Harden Mains, Jedburgh  
 1846 Barstow, Charles M., C.A., 32 India Street, Edinburgh  
 1867 Bartholomew, Hugh, 157 St Vincent Street, Glasgow  
 1855 Bartholomew, Jas., Duntarvie, Winchburgh  
 1873 Barty, James W., Procurator-Fiscal, Dunblane  
 1871 Bate, John, of Broadchapel, Lochmaben  
 1865 Bateson, Sam. S., 17 Bolton Street, London.  
 1861 Bathgate, James, Bower House, Lauder  
 1873 Bauchope, Thomas, Land Surveyor, East Brucefield, West Calder  
 1854 Baxter, Edmund, W.S., Edinburgh  
 1864 Bayne, John, Builder, Bridge of Allan  
 1869 Bayne, Lewis, Kimmel Park, St Asaph, N. Wales  
 1862 Bayne, William, Foodie, Cupar-Fife  
 1868 Beath, David, Auchmuir, Leslie  
 1872 Beattie, Adam, Builder, 33 Chalmers Street, Edinburgh  
 1854 Beattie, James, Newbie House, Annan  
 1870 Beattie, Jn., Bulmansknowe, Canonbie  
 1858 Beattie, Peter, Dunnydeer, Inch  
 1871 Begbie, Joshua Arthur Howard, Laggan, Ulva, Aros

## Admitted

- 1852 Begbie, Thos., Queenston Bank, Drem  
 1858 Begg, John, Distiller, Balmoral, Crathie  
 1873 Begg, Robert, Blarnie, Luss  
 1873 Begg, Robert Burns, junior, Kinross  
 1871 Beith, Donald, W.S., Edinburgh  
 1871 Belfrage, A. W., C.E., 31 Ann Street, Edinburgh  
 1849 Belfrage, G., 59 Forest Road, Edinburgh  
 1849 Belfrage, Jas., Samuelston East Mains, Haddington  
 1867 Bell, Alexander, Linton, Kelso  
 1868 Bell, Alexander, Stobahill, Lockerbie  
 1872 Bell, And., Fans, Earlstoun  
 1856 Bell, David, Todhall, Cupar-Fife  
 1871 Bell, George, Barns of Claverhouse, Dundee  
 1835 Bell, G. Graham, of Crurie, Advocate, Castle O'er, Langholm  
 1863 Bell, James, Woodhouselees, Canonbie  
 1859 Bell, J., Glenduckie, Newburgh, Fife  
 1871 Bell, John (of Castlecreavie), 47 Great King Street, Edinburgh  
 1871 Bell, M. Montgomery, W.S., Edinburgh  
 1846 Bell, R., of Lunna, Belmont, Falkirk  
 1869 Bell, Robert, 37 Restalrig Terrace, Leith  
 1856 Bell, Thomas, Ballinshoe, Kirriemuir  
 1865 Bell, Thomas, Glentarkie, Strathmiglo  
 1871 Bell, William, of Gribdæ, Kirkcudbright  
 1869 Bell, William, Rockdale Cottage, Perth  
 1858 Benton, Joseph, Cattie, Whitehouse  
 1858 Benton, Wm., Hartmill, Whitehouse  
 1869 Berry, George, Longleat, Warminster, Wilts  
 1848 Berry, John, of Tayfield, Newport, Fife  
 1863 Berry, Walter, 16 Carlton Terrace, Edinburgh  
 1864 Bertram, James, Addinston, Lauder  
 1874 Bertram, John, Hartside, Lauder  
 1854 Bertram, John S., Cranshaws, Dunse  
 1845 Bertram, T. Hardy, C.E., 1 Foxgrave Road, Beckenham, Kent  
 1852 Bertram, William, of Nisbet, Biggar  
 1861 Berwick, David, Collairnie, Newburgh, Fife  
 1872 Beswicke-Royds, C. R. N., Pyke House, Littleborough, Manchester  
 1857 Bethune, Admiral, of Balfour, C.B., Markinch  
 1848 Bethune, Alex., of Blebo, Cupar-Fife  
 1863 Bethune, Maj. R., of Nydie, St Andrews  
 1864 Bethune, Murdo, Muirton, Beaully  
 1861 Bett, David J., Newhall, Coupar-Angus  
 1857 Bett, James, Bolfracks, Aberfeldy

Admitted

- 1859 Beveridge, David, Buckthorns, Largo  
 1862 Beveridge, George, 248 High Street, Kirkcaldy  
 1851 Beveridge, J., of Balado, Kinross  
 1869 Beveridge, James, Crombie, Dunfermline  
 1853 Beveridge, Robert E., Urquhart, Dunfermline  
 1872 Beveridge, William, of Bonnyton, Dunfermline  
 1862 Beveridge, William, 248 High Street, Kirkcaldy  
 1872 Bickerton, Rich., Tweedmouth Implementation Works, Berwick-on-Tweed  
 1858 Biggar, T., of Chapelton, Dalbeattie  
 1859 Binnie, John, Birnieknows, Cockburnspath  
 1875 Binny, Andrew, 9 Hart Street, Edinburgh  
 1871 Binny, C. C., Bardrill, Blackford  
 1865 Binny, Graham, W.S., Edinburgh  
 1874 Bird, Ebenezer, Glenduckie, Newburgh, Fife  
 1858 Bird, James B., Fishwick, Paxton  
 1867 Birket, J., of Broom Rigg, Ainstable, Penrith  
 1875 Birse, John, Summerfield, St Ola, Orkney  
 1874 Biscoe, T. Ramsay, yr. of Newton, Inverness  
 1846 Biscoe, T. P. B., of Kingillie, Inverness  
 1862 Bisset, The Ven. Archdeacon, of Lessendrum, Huntly  
 1873 Bisset, Hugh, Pittarrow, Laurencekirk  
 1873 Bisset, Thos. S., Agricultural Engineer, Blairgowrie  
 1869 Bisset, W. A., East Wemyss, Kirkcaldy  
 1856 Black, Alex., Civil Engineer, Falkirk  
 1865 Black, Alex., North Neve, Meikle  
 1871 Black, James, *Elgin Courier*, Elgin  
 1851 Black, James, London  
 1838 Black, James, Merchant, Glasgow  
 1857 Black, James W., Wandel, Abington  
 1859 Black, John, Setonhill, Longniddry  
 1859 Black, John, Ford, Westfield, Cornhill, Northumberland  
 1844 Black, Robert, Glasgow  
 1846 Blackburn, Robert B., Advocate, Sheriff of Stirling and Dumbarton  
 1855 Blackley, John, 135 St Vincent Street, Glasgow  
 1870 Blacklaw, Alex. Scott (late Milton of Arbuthnot, Fordoun), Brazil  
 1857 Blacklock, Adam, late Minnygap, Moffat  
 1870 Blackstock, John, Haytoun Castle, Maryport  
 1842 Blackwood, John, Publisher, Edinburgh

Admitted

- 1862 Blackwood, William, Publisher, Edinburgh  
 1854 Blair, Campbell, 36 Elmbank Crescent, Glasgow  
 1850 Blair, Sir Edward Hunter, of Blairquhan, Bart., Maybole  
 1869 Blair, E. J. Stopford, of Penninghame, Newton Stewart  
 1860 Blair, James, of Glenfoot, Tillicoultry  
 1864 Blair, James, Rowardennan, Luss  
 1874 Blair, John, 25 Greenhill Gardens, Edinburgh  
 1874 Blair, Patrick, Advocate, Sheriff-Substitute, Inverness  
 1844 Blair, Captain William Fordyce, of Blair, R.N., Dalry  
 1873 Bland, Thomas, Greystone, Tullynessle, Alford  
 1836 Blandow, M. Von, St Petersburg—*Honorary Associate*  
 1836 Blane, Colonel Robert, C.B.  
 1847 Blanshard, George, 7 Carlton Terrace, Edinburgh  
 1843† Blantyre, Right Hon. Lord, Erskine House, Glasgow  
 1861 Blues, Andrew A., Dalruscan, Tinwald, Dumfries  
 1861 Blyth, D., Leckiebank, Auchtermuchty  
 1872 Blythe, William, Whitrigs, Hawick  
 1871 Bogie, George, of Gairney Bridge, Kinross  
 1864 Bogie, James, Harp Cottage, East Newport, Dundee  
 1851 Bogie, J., Balcanquhal, Auchtermuchty  
 1863 Bolam, John, Chathill, Northumberland  
 1866 Bolam, Robert George, Weetwood Hall, Wooler  
 1858 Bolton, Joseph C., of Carbrook, Larbert  
 1867 Bone, Quintin, Greenan, Ayr  
 1853 Bontine, Wm. Cuninghame Graham of Gartmore  
 1870 Boog, Thomas Elliot, Timpendean, Jedburgh  
 1842 Booth, Jas. Godfrey, Seed Merchant, Hamburg  
 1862 Borland, Robert, Auchencraigh, Closeburn  
 1871 Borthwick, Dr Alex. B., Dumfries  
 1873 Borthwick, Alex. Hay, Hoprig, Langholm  
 1859 Borthwick, Alex. Hay, St Dunstan's, Melrose  
 1854 Borthwick, Gilbert, Frogden, Kelso  
 1858 Borthwick, John, V.S., Kirkliston  
 1846 Borthwick, John, of Crookston, Stow  
 1859 Borthwick, John James M., Georgefield, Langholm  
 1838 Borthwick, Thomas Chalmers, Hoprig, Langholm

*List of Members of the*

Admitted		Admitted	
1857	Borthwick, Wm. Henry, late Crookston, Gorebridge	1874	Brodie, J. C. J., of Lethen, Nairn
1865	Borthwick, Wm., Whitehaven Castle, Whitehaven	1874	Brooke, A. B., Cardney, Dunkeld
1864	Borton, John, Barton House, Malton	1872	Broom, William, of Girgenti, Kilwinning
1861	Bosomworth, John, Poplars, Abernethy, Newburgh, Fife	1855	Broomfield, Thomas, Lauder
1858	BOSWALL, Sir Geo. Houston, of Blackadder, Bart., Chirnside	1867	Bromfield, W. J., Old Greenlaw, Greenlaw, Dunse
1862	Bowhill, James, Banker, Ayton.	1875	Brothie, George, of Firbo, Firbo House, Westray, Orkney
1854	Bowie, Alexander, Mains of Kelly, Arbroath	1854	Broughton, Robert Henry, of Rowchester, Greenlaw
1875	Bowie, Robert, Parkhead, Linlithgow	1863	Brown, Adam, Helmburn, Selkirk
1875	Bowie, Robert, Seedsman, Glasgow	1844	Brown, Alex. J. Dennistoun, of Balloch, Dumbarton
1859	Bowman, James, Newark, Pittenweem	1873	Brown, Alexander, Banker, Oban
1863	BOWMONT, Most Noble the Marquis of, Floors Castle, Kelso	1852	Brown, Andrew, M.D., late Edinburgh
1865	Boyd, Colonel James Hay, of Townend, Symington, Kilmarnock	1858	Brown, Archibald, Craig, Udney
1872	Boyd, John, Simprim Mains, Coldstream	1874	Brown, Archibald C., Gladstone, Bishopton
1861	Boyd, John B., of Cherrytrees, Kelso	1866	Brown, David, Banker, Maybole
1874	Boyd, Joseph, 79 Park Road, Glasgow	1871	Brown, George, Grassmistoun, Crail
1863	Boyd, Wm. B., Ormiston, Kirkbank, Kelso	1872	Brown, George, Writer, Pollockshaws
1869	Brakenridge, William, Liddell Bank, Canonbie	1839	Brown, George, Watten Mains, Watten
1865	Braid, Andrew, Humble, Kirknewton	1851	Brown, George, of Westfield, Cupar Fife
1858	Brand, Charles, Mains of Fordoun, Fordoun	1860	Brown, James, Hardgrave, Lockerbie
1872	Brand, James, Dunbar	1849	Brown, James, of Orchard, Carlisle
1855	Brash, James, Hallyards, Kirkliston	1865	Brown, James, Whinpark, Kilmarnock
1871	BREADALBANE, Right Hon. the Earl of, Taymouth Castle, Aberfeldy	1861	Brown, James, Leuchars Castle, Leuchars
1834	Brebner, James, Advocate, Enfield, Cults, Aberdeen	1855	Brown, James, Liberton Mains, Carnwath
1873	Breingan, Alex., Helensburgh	1873	Brown, James Geddes, Distiller, Keith
1869	Brewster, Robert, Barnbeth, Bridge of Weir	1837	Brown, James T., late of Auchlochlan, Leuchmahagow
1872	Brigham, John, Castle Gate Implementation Works, Berwick-on-Tweed	1872	Brown, John, Blinkbonny, Gorebridge
1865	Brims, James, Thurso	1857	Brown, John, Boghall, Biggar
1868	Broadwood, Thomas, of Fulfordlees, Crowhill, Dunbar	1860	Brown, John, Ingliston, Dumfries
1874	Brock, John, Aukhorne, Wick	1852	Brown, John George, Cluny Cottage, Pitlochry
1873	Brock, William, Barns of Clyde, Yoker	1860	Brown, J. C., late Bridekirk Mains, Annan
1857	Brockley, Robert M., Gourlaw, Rosewell	1870	Brown, Jos., Hermitage, Dalbeattie
1875	Brodie, Hugh, of Brodie, Brodie Castle, Forres	1832	Brown, Matthew, Greenock
1859	Brodie, James, Parson's Pool, Lasswade	1861	Brown, Oliphant, Shiel, New Galloway
1848	Brodie, James C., Thorntonloch, Dunbar	1856	Brown, Peter, Craigton, Bishopton
1863	Brodie, James W. (late Leaston, Upper Keith), Australia	1871	Brown, Peter, Milton of Luncarty, Redgorton
1872	Brodie, John, Palacehill, Ancrum, Jedburgh	1856	Brown, Robert, Auctioneer, Balfour
1840	Brodie, J. Clerk, of Idvies, W.S., 26 Moray Place, Edinburgh	1866	Brown, Robert, Little Ley, Cluny, Aberdeen
		1866	Brown, Robert E., F.G.S., Farnley Hall, Otley, Yorkshire
		1849	Brown, Thomas, Weston, Dunsyre, Carnwath
		1863	Brown, Thos., late Locherlour, Crieff
		1863	Brown, Thomas, 4 Carlung Place, Edinburgh
		1863	Brown, Thomas, Secretary, Agricultural Society, Campbeltown

Admitted

- 1871 Brown, William, Factor, Earlsmill,  
Forres—*Free Life Member*, 1873  
1855 Brown, Dr William, Melrose  
1828 Brown, William, Merchant, Glasgow  
1872 Brown, William, Parkgatestone, Biggar  
1854 Brown, William, Linkwood, Elgin  
1873 Brown, William, Pitnamoon, Laurence-  
kirk  
1874 Browne, A. H., Doxford Hall, Chathill,  
Northumberland  
1873 Browne, Colville, Long Melford, Suf-  
folk—*Free Life Member*  
1872 Brownlie, Alex., Haughhead, Earlsstoun  
1868 Bruce, Alex., Millhill, Mintlaw  
1874 Bruce, Andrew Hamilton Tyndall, of  
Falkland, Ladybank  
1862 Bruce, Charles, Broadland, Huntly  
1864 Bruce, George, Veensgarth, Lerwick  
1868 Bruce, Geo., Heatherwick, Keith Hall  
1874 Bruce, George, Wealthton, Keig,  
Aberdeenshire  
1871 Bruce, George C., C.E., Edinburgh  
1865 Bruce, James, Burnside, Fochabers  
1869 Bruce, Jas., Longbridgemoor, Annan  
1868 Bruce, J., Inverquhomery, Mintlaw  
1829 Bruce, John, of Sumburgh, Lerwick  
1863 Bruce, J., jun., Sumburgh, Lerwick  
1842 Bruce, John, W.S., 7 Melville Crescent,  
Edinburgh  
1868 Bruce, Robert, Newton of Struthers,  
Forres  
1871 Bruce, Robert, Uddingston  
1852 Bruce, Hon. Thomas Charles, 18  
Hertford Street, Mayfair, London  
1855 Bruce, Thomas, of Arnot, Kingsdale,  
Kennoway  
1864 Bruce, Sir William C., of Stenhouse,  
Bart., Falkirk  
1870 Bruges, Edward C., Dalgig, New Cum-  
nock  
1866 Brunton, James, Broomlands, Kelso  
1867 Brunton, J. S., Ladhope House, Gala-  
shiels  
1870 Bryan, F. G. D., Frederickstadt, Coat-  
bridge  
1846 Bryce, David, Architect, Edinburgh  
1865 Bryce, James, East Whitburn, Whit-  
burn  
1862 Brydon, Adam, Netherbarns, Gala-  
shiels  
1864 Brydon, H., Thirlestane Hope, Selkirk  
1850 Brydon, James, Kinnelhead, Moffat  
1864 Brydon, James, jun., Holm of Dalqu-  
hairn, Dalry, New Galloway  
1857 Brydon, John, Mouthooly, Jedburgh  
1873 Brydon, Robert, The Dene, Seaham  
Harbour—*Free Life Member*  
1863 Brydon, Walter, Burncastle, Lauder  
1871 Bryson, James, 47 George Street, Edin.  
1850 Bryson, Robert, Merchant, Glasgow

Admitted

- 1852 Bryson, W. G., Cullen House, Cullen  
1828\*†BUCCLEUCH and QUEENSBERRY, His  
Grace the Duke of, K.G., Dalkeith  
1835 BUCCLEUCH and QUEENSBERRY, Her  
Grace the Duchess of  
1854 Buchanan, A., Whitehouse, Stirling  
1857 Buchanan, Alexander, Garscadden  
Mains, East Kilpatrick, Glasgow  
1827 Buchanan, Andrew, of Mount Vernon,  
Shettleston  
1838 Buchanan, Andrew, of Auchintorlie  
Bowling  
1870 Buchanan, Archibald, Barskimming,  
Mauchline  
1849 Buchanan, Lieut.-Col. David C. R.  
Carrick, of Drumpellier, Coatbridge  
1873 Buchanan, David, Garscadden Mains,  
New Kilpatrick  
1853 Buchanan, Dun., Auchenbreck, Colin-  
traive, Greenock  
1851 Buchanan, Isaac, Hamilton, Canada  
1838 Buchanan, James, Glasgow  
1838 Buchanan, John, London  
1844 Buchanan, J., Coneyhill House, Bridge  
of Allan  
1872 Buchanan, John, C.E., 24 George  
Street, Edinburgh  
1873 Buchanan, Robert, Letter Farm, Kil-  
learn  
1864 Buchanan, Robert M., Livingston Mill,  
Mid-Calder  
1849 Buchanan, T. G., of Wellshot, Cam-  
buslang  
1842 Buchanan, Walter, Glasgow  
1828 Buchanan, Wm., Merchant, Glasgow  
1842 Buist, James, of Lawpark, St Andrews  
1863 Buist, Robert, Cattle Salesman, Edin-  
burgh  
1865 Bulloch, Ar., Milhken, East Kilpatrick  
1870 BURDETT-COURTIS, Right Hon. Baroness,  
Ehrenberg Hall, Torquay  
1874 Burn, Forbes, Hardacres, Coldstream  
—*Free Life Member*  
1863 Burn, John, Ednam, Kelso  
1860 Burn, Robert Scott, Fern Lea, Cheadle,  
Manchester  
1873 Burness, Wm., Redford, Laurencekirk  
1867 Burnett, Major-General Francis Claude,  
of Gadgirth, Tarbolton  
1848 Burnett, George, Advocate, Edinburgh  
1840 Burnett, Gregory, Dee Cottage, Flint  
1834 BURNETT, Sir James Horn, of Leys,  
Bart., Crathes Castle, Banchory  
1834 Burnett, Newell, Advocate, Aberdeen  
1858 Burnett, Robert, yr. of Leys, Crathes  
Castle, Banchory  
1838 Burnley, W. F., 24 Ainslie Pl., Edin.  
1872 Burns, And., Harelaw, Longniddry  
1865 Burns, Jas. C., of Glenlee, Hamilton  
1865 Burns, J., of Castle Wemyss, Greenock

## Admitted

- 1861 Burns, John William, of Kilmahew,  
Dumbarton  
1867 Burr, Rev. P. Lorimer. Lundie Manse,  
Dundee  
1873 Burrell, James, Denovan Mains, Denny  
1854 Burroughs, Col. F. W. Traill, of Rou-  
say, Orkney  
1859 Bursby, George G., West Fallodon,  
Chathill  
1867 Burton, J. Tait, of Toxside, Ratho  
Hall, Ratho  
1857 Burton, J., Rosewell Mains, Rosewell  
1869+ BUTE, Most Noble the Marquis of,  
Mount Stuart, Rothesay  
1861 Buttar, David, Corston, Coupar-Angus  
1825 Butter, Arch., of Faskally, Pitlochry  
1869 Butter, Colonel Archibald, yr. of Fas-  
kally, Pitlochry  
1875 Byron, Commander Richard H., En-  
gliston, Inverness  
1844 Buttery, A. W., Chapelhall, Airdrie  
  
1844 Cadell, Alex. Todd. R.A., V.C., Madras  
1856 Cadell, Henry, of Grange, Bo'ness  
1869 Cadzow, James, Clarendon, Linlith-  
gow  
1872 Cadzow, Robt., Thornyhill, Carmichael,  
Lanark  
1869 Caird, Alex. McNeel, Genoch House,  
Stranraer  
1853 Caird, James, of Cassencarie, C.B.,  
8 Queensgate Gardens, London  
1864 Cairns, James, Balquharn, Menstrie  
1870 Cairns, John, Cults Lime Works, Lady-  
bank  
1861 Cairns, William, Belhie, Auchterarder  
1871 Cairns, Robert, Bertha Park, Perth  
1845+ CAITHNESS, Right Hon. the Earl of,  
Barrogill Castle, Wick  
1872 Calder, Adam, Yetholm Mains, Kelso  
1853 Calder, Francis, Yetholm Mains, Kelso  
1857 Calder, James, Colgrain, Cardross  
1870 Calder, John, Muirton, Elgin  
1846 Calder, Marcus, Elwickbank, Kirkwall  
1857 Calder, Robert, Kelloe Mains, Edrom  
1858 Calder, R., Whitehouse, Lumphanan  
1851 Calder, W., Cattle Salesman, Edinburgh  
1872 Calder, W. A., Oxenrig, Coldstream  
1841 Caldwell, Frederick, of Missinish  
1862 Caldwell, Wm., Boydstone, Ardrossan  
1843 Callender, Henry, C.A., Edinburgh  
1854 Cameron, Alex., Glackeriska, Appin  
1857 Cameron, Alex., late Old Inns, Cum-  
bernauld  
1865 Cameron, Alex. (of Mainhouse), High-  
field, Elgin  
1859 Cameron, Donald, of Lochiel, M.P.  
Auchnacarry, Fort-William  
1861 Cameron, D. Colin, Tallisker, Portree  
1869 Cameron, Duncan, Banker, Peaulay

## Admitted

- 1857 Cameron, James, Balnakyle, Munlochry  
1871 Cameron, John, Glackeriska, Appin  
1850 Cameron, P., 6 Regent Terrace, Edin.  
1862 Cameron, William, Edinburgh  
1845 CAMPBELL, Sir Alex., of Barcaldine,  
Bart.  
1837 Campbell, Alex., of Auchindarroch,  
Lochgilphead  
1835 Campbell, A., of Cambo, 6 Charlotte  
Square, Edinburgh  
1857 Campbell, A., Crosshill, Bishopbriggs  
1868 Campbell, Alex., Blairton, Belhelvie  
1863 Campbell, A. H., of Little Grove, Herts  
1826 Campbell, Archibald, of Glendaruel  
1857 Campbell, Lt.-Col. Archd., of Blyths-  
wood, Renfrew  
1868 Campbell, A., Dunmore Park, Stirling  
1865 Campbell, Lt.-Col. A. H., Retired List,  
Bengal Army, Easter Elchies, Craigel-  
lachie  
1865 Campbell, Lt.-Col., of South Hall,  
Greenock  
1816 Campbell, A., of Catrine, W.S., 3  
Drummond Place, Edinburgh  
1854 Campbell, A., yr. of Catrine, W.S., 4  
Randolph Crescent, Edinburgh  
1871 Campbell, Archd., Gaskbeg, Laggan,  
Kingussie  
1864 Campbell, C. Macpherson, of Ballimore,  
Tignabruaich  
1853 Campbell, Chas. V. H., of Nether Place,  
Cairnhill, Kilmarnock  
1847 Campbell, C., of Colgrain, Camis Easkan  
House, Helensburgh  
1838 Campbell, C. G., of Stonefield, Tarbert  
1858 Campbell, Rear-Admiral Colin Yorke,  
of Barbreck, Lochgilphead  
1868 Campbell, Captain D. P. (of Balliveolen,  
Bonaw), New Club, Edinburgh  
1867 Campbell, Donald, Ulva, Aros  
1858 Campbell, D. T., Duiletter, Dalmally  
1839 Campbell, Farquhar (of Rum), New  
Club, Edinburgh  
1871 Campbell, George, Rhodes, North  
Berwick  
1873 Campbell, George, Shanes Castle, An-  
trim—*Free Life Member*  
1863 Campbell, George William, Mayfair,  
London  
1835 Campbell, Colonel George J., of Cess-  
nock, Treesbank House, Kilmarnock  
1867 Campbell, Hector A. (of Auchnacloich,  
Oban), Ardfenaig, Bunnellan, Mull  
1823 Campbell, H. F., of Boquhan, Kippen  
1834 CAMPBELL, Sir Hugh Hume, of March-  
mont, Bart., Dunse  
1861 Campbell, Hugh, Surgeon, Glenral-  
loch, Tarbert, Lochfine  
1838 CAMPBELL, Sir Jas., of Aberuchil, Bart.  
Wheatmead Park, Lydney



Admitted

- 1838 CAMPBELL, Sir James, of Stracathro, Glasgow  
 1838 Campbell, James, London  
 1847 Campbell, J., of Tillichewan, Dum-barton  
 1833 Campbell, James Archd., of New Inverawe, Rugby  
 1849 Campbell, James A., yr. of Stracathro, Glasgow  
 1860 Campbell, James G., of Killyleoch, 23 Windsor Street, Edinburgh  
 1874 Campbell, John, of Kilberry, Tarbert  
 1848 Campbell, John, of Possil, Torquay  
 1846 Campbell, J. L., of Achalader, Blairgowrie  
 1857 CAMPBELL, Lt.-Gen. Sir John, C.B. and K.C.S.I., United Service Club, Edin.  
 1874 Campbell, John, 15 Exchange Square, Glasgow  
 1857 Campbell, Jn., Rhemeul, Campbeltown  
 1857 Campbell, John, of Inverardoch, Doune  
 1865 Campbell, John D., of Peaton, Clachan, Roseneath, Helensburgh  
 1863 Campbell, John Graham, of Shirvan, Castleton, Lochgilphead  
 1843 Campbell, K., of Ardow, Tobermory  
 1863 Campbell, Neill Colquhoun, of Barnhill, Sheriff of Ayr, 81 Great King Street, Edinburgh  
 1838 Campbell, Ord Graham, 5 Oxford Terrace, Edinburgh  
 1836 Campbell, R. D., of Jura, Portaskaig, Greenock  
 1802 Campbell, R., of Sonachan, Inveraray  
 1861 Campbell, R. F. F., of Craigie, Ayr  
 1858 Campbell, Silvester, Kinnellar, Blackburn, Aberdeen  
 1860 Campbell, Thos., Croftness, Aberfeldy  
 1864 Campbell, T. H., of Millfield, Polmont  
 1856 Campbell, T. W., of Walton Park, Dalbeattie  
 1836 Campbell, Col. W., N.B. Staff, Barn-cleuth, Hamilton  
 1839 Campbell, W., of Ormsary, Ardrishaig  
 1858 Campbell, William, Solicitor, Hamilton  
 1861 Campbell, W., Cladville, Islay  
 1871 CAMPERDOWN, Right Hon. the Earl of, Camperdown, Dundee  
 1863 Cant, James, Orr Bridge, Kirkcaldy  
 1852 Cantlie, Wm., Keithmore, Dufftown  
 1850 Carfrae, T., Land-Surveyor, Edinburgh  
 1845 Carlyle, T. J., of Waterbeck, Templehill, Ecclefechan  
 1825 Carmichael, M. T., of Eastend, Lanark  
 1856 CARMICHAEL, Sir William H. Gibson, of Castle Craig and Skirling, Bart., Lamancha  
 1871 Carmichael, William, Pool, Carnwath  
 1856 CAENEIE, Hon. Charles, Kinnaird Castle, Brechin

Admitted

- 1847 Carnegie, D., of Stronvar, Lochearn-head  
 1869 Carnegie, Henry L., of Kinblethmont, Arbroath  
 1852 Carnegie, James, W.S., Edinburgh  
 1836 Carnegie, John, of Redhall, Fordoun  
 1873 Carnegie, John, Grain and Commission Agent, Stirling  
 1858 Carnegie, William, of Eastertown, Dun-lappie, Brechin  
 1858 Carnegie, W., junior, Coul, Forfar  
 1850 Carnegie, John, Glasgow  
 1861 Carphin, George, Banker, Dunkeld  
 1869 Carphin, Jas. Rhind, C.A., Edinburgh  
 1871 Carrick, Charles, Baad, Stirling  
 1872 Carrick, Thos. A., Easter Cambus-drennie, Stirling  
 1854 Carruthers, John, of Miln, Kirkhill, Moffat  
 1870 Carruthers, John, Tundergarth, Lockerbie  
 1870 Carruthers, Joseph, Broomhill, Annan  
 1875 Carruthers, Robert, jun., *Courier* Office, Inverness  
 1870 Carruthers, R. B., Huntingdon Lodge, Dumfries  
 1848 Carruthers, Wm. Francis, of Dormont, Lockerbie  
 1838 Carstairs, Drysdale, Hailes House, Fairfield, Liverpool  
 1869 Carswell, David, jun., Straiton, Leuchars  
 1863 Carter, Thomas, Yew Tree Cottage, Grange, Edinburgh  
 1864 Carter, Walter, Bank Agent, Ayton  
 1863 Cartwright, T. R. B. Leslie-Melville, Melville House, Ladybank  
 1861 Carver, John, Kinloch, Meigle  
 1871 CATHCART, Lieut.-Colonel the Hon. Adolphus F., Calder, Dunse  
 1819 Cathcart, Elias, of Auchindrane, Ayr  
 1834 CATHCART, Sir John Andrew, of Carleton, Bart., Killochan Castle, Girvan  
 1857 Cathcart, R., of Pitcairnie, Auchtermuchty  
 1872 Catley, W. E., of Edderton, Ospisdale, Sutherlandshire  
 1866 Cattanaach, A., of Auchintorlie, Paisley  
 1873 Cave-Browne, Rev. W. H., Dunmore, Stirling  
 1871 Caverhill, John, Greenburn, Ayton  
 1839 CAWDOE, Right Hon. the Earl, Stackpole Court, Pembroke, South Wales  
 1874 Chalmers, Archibald, of Kipp, Dalbeattie  
 1824 Chalmers, C., of Monkshill, Aberdeen  
 1871 Chalmers, James, Shielhill, Stanley, Perth  
 1860 Chalmers, Thomas, of Longcroft House, Linlithgow

Admitted	Admitted
1869 Chambers, William, of Glenormiston, Edinburgh	1861 Christie, P., Mains of Scotsraig, Tay-port
1864 Chambers, William, Soutarton, Forge, Huntly	1857 Christie, T. C., of Bedlay, Moodiesburn
1864 Chambers, Robert, 10 Claremont Crescent, Edinburgh	1848 CHRISTISON, Sir Robert. Bart., M.D., Professor of Materia Medica, University of Edinburgh
1870 Chambers, Thos., of Pelutho, Abbey Town, Cumberland	1871 Chrystal, George, Engineer, Perth
1849 Chancellor, J. G., of Shieldhill, Biggar	1834 Chrystie, Captain A., late H.I.C.S.
1857 Chandler, Henry, Salford	1855 Church, D. M., Ferniebank, Liberton
1869 Chaplin, Geo. C. Child, of Colliston, Arbroath	1838 Church, J., Tower of Sark, Canonbie
1873 Chapman, James, Ballencrieff Mill, Bathgate	1860 Church, Miss Margaret, Park House, Canonbie
1871 Chapman, Lawrence, Solicitor, Blairgowrie	1859 Clapperton, Jas., Garvald Mains. Pres-tonkirk
1873 Chapman, Mungo, Auctioneer, Bathgate	1855 Clapperton, John, Newlands, Gifford
1873 Charles, John, Town and County Bank, Inverurie	1864 Clapperton, John, 371 High Street, Edinburgh
1867 Charlton, Matthew, jun., Browndean-laws, Jedburgh	1869 Clark, Archd., Garvie, Colintrave
1860 Cheape, Lieut.-Col. Charles, of Killundine, Morven	1858 Clark, Arch., Inverchapel, Kilmun
1864 Cheape, G. C., of Strathtyrum, Wellfield, Strathmiglo	1838 Clark, Francis Wm., of Ulva, Aros
1874 CHETWYND, Captain, the Hon. Henry W., R.N., Main, Elgin	1842 Clark, James, Wormiston, Crail
1838 Chiens, George Tod, C.A., Edinburgh	1857 Clak, James, of Crossbasket, Glasgow
1860 Chirnside, G., Edrington House, Berwick	1864 Clark, James, Oldhamstocks Mains, Cockburnspath
1865 Chisholm, Duncan, Treenlaur, Newport, Mayo, Ireland	1857 Clark, John, Flender, Busby
1865 Chisholm, The, Erchless Castle, Inverness	1869 CLARK, Sir John F., of Tillyprony, Bart., Tarland
1874 Chisholm, John, Land Steward, Achnacarry, Fort-William	1858 Clark, John Gilchrist, of Speddock, Dabton, Thornhill
1854 Chisholm, John, Charleston, Inverness	1872 Clark, John M., of Garthdee House, Aberdeen
1874 Chisholm, John, Ironmonger, Inverness	1867 Clark, Lachlan, Tangy, Campbeltown
1831 Chisholm, Lachlan, late of Lochans	1869 Clark, Matt., Croftengae, Alexandria
1850 Christie, Andrew, Adinston, Tranent	1862 Clark, M., of Little Culmain, Crockettford, Dumfries
1850 Christie, Charles J., Westbank, Tranent	1875 Clark, Peter (Fowler & Co., Seedsman), Glasgow
1862 Christie, C. J., Timber Bush, Leith	1871 Clark, Robert, Taybank House, Errol
1864 Christie, George, Southfield House, Stirling	1852 Clark, Samuel, Manswrae, Bridge of Weir
1873 Christie, James, Bankend, Stirling	1873 Clark, William, Northfield, Denny
1865 Christie, James, Blandfield, Edinburgh	1857 Clark, William, Shawhill, Monkton
1873 Christie, James, Cultenhove Mains, St Ninians	1871 Clark, William, Starr, Cupar-Fife
1835 Christie, Captain James, Hillend, Clackmannan	1873 Clark, Rev. Wm. Aitkinson, Belford Hall, Belford
1863 Christie, J. H. R. S., of Teasses, Largo	1871 Clark, W. B., Sher-Sub. of Clackmannanshire, Marhill House, Alloa
1846 Christie, John, 10 Pitville Parade, Cheltenham	1847 Clarke, Alex., of Rosemount, Tain
1872 Christie, John, of Cowden, Dollar	1865 Clarke, Alexander M., Meddat, Parkhill
1874 Christie, John, West Mains, Haddington	1871 Clarke, J. F., Cowgask, Auchterarder
	1869 Clarke, John, Spindlehowe, Uddingstone
	1873 Clarke, William, Hopewell, Tarland
	1854 Clay, John, Kerchesters, Kelso
	1870 Cleghorn, Hugh, M.D., of Stravithy, St Andrews
	1875 Clelland, James, Knockenlaw, Kilmarnock

Admitted

- 1880 Clerk, Duncan, Writer, Oban  
 1857 Clinie, William, Paisley  
 1871 CLINTON, Right Hon. Lord, Fettercairn House, Fettercairn  
 1850 Clouston, Peter, Glasgow  
 1871 Clyne, David, Reaster, Wick  
 1852 COATS, Sir Peter, of Woodside, Paisley  
 1852 Coats, Thomas, of Ferguslie, Paisley  
 1848 Cobb, William, Mains of Fintray, Dundee  
 1861 Cochrane, Alexander. of Ashkirk, Hawick  
 1842 Cochrane, Alex. Baillie, of Lamington, M.P., Lamington  
 1849 Cochrane, James, of Harburn, Edin.  
 1858 Cochrane, James, Little Haddo, Newburgh, Aberdeen  
 1861 Cockburn, George, Kilchiaron, Portcharlotte, Islay  
 1866 Cockburn, Arch. D., 6 Athole Crescent, Edinburgh  
 1873 Cockburn, James, Greenfield, Foulden, Berwick  
 1867 Cockburn, William, V.S., 112 North Street, Glasgow  
 1830 Cogan, Robert, Merchant, Glasgow  
 1870 Coghill, David, 141 Cumberland Street, Glasgow  
 1870 Coghill, George, 141 Cumberland Street, Glasgow  
 1838 COLEBROKE, Sir Thomas Edward, of Crawford, Bart., M.P., Abington  
 1868 Collie, Alexander W., Lairshill, New Machar, Aberdeen  
 1843 Collier, Jn., Hatton House, Carnoustie  
 1857 Collyer, William D., of Cormiston, Biggar  
 1873 Colquhoun, George, Shemore, Luss  
 1872 COLQUHOUN, Sir James, of Luss, Bart., Ross-dhu, Luss  
 1850 Colquhoun, J., Corkerhill, Pollockshaws  
 1874 Colquhoun, Rev. J. E. Campbell, Kilmont, Glasgow  
 1872 Colthart, Robert, Achateny, Ardnarmurchan  
 1851 COLVILLE of Culross, Right Hon. Lord, 42 Eaton Place, London  
 1871 Colvin, James E., Wester Manbeen, Elgin  
 1874 Colvin, John, Solicitor, Inverness  
 1860 Colvin, Wm., of Craigielands, Moffat  
 1873 Common, James, Capplefoot, Lockerbie  
 1871 Comrie, Alex., E. Ballindean, Inchture  
 1874 Conacher, P. M., Gallin Cottage, Glenlyon, Aberfeldy  
 1873 Coningham, W. J. C., High Street, Haddington  
 1843 Connel, James, of Conheath, Irvine House, Langholm

Admitted

- 1852 Conning, John, Solicitor, Perth  
 1875 Constable, Alex. Cowan, 10 Morningside Place, Edinburgh  
 1852 Constable, G., of Soylziary, Balmyle, Blairgowrie  
 1854 Constable, James C., of Callie, Balmyle, Blairgowrie  
 1860 Constable, James, of Glencraig, Lochgelly  
 1864 Constable, Rev. John, Principal of the Royal Agricultural College, Cirencester  
 1871 Cook, Charles, Invercauld Arms, Bal-later  
 1841 Cook, John, W.S., Edinburgh  
 1865 Cooper, Alexander, Solicitor, Elgin  
 1845 Cooper, H. R., of Ballindalloch, Bal-fon  
 1858 Cooper, James, Chapleton, Methlic, Ellon  
 1845 Cooper, William, of Failford, Smithston House, Tarbolton  
 1874 Cooper, William S., yr. of Failford, Tarbolton  
 1855 Copland, R., Mill of Ardlathen, Ellon  
 1864 Copland, Jn., Mainshead, Dumfries  
 1840 Cordiner, W. F., Mormond House, Cortes, Lonmay  
 1860 Corrie, Adam, South Park, Borgue, Kirkcudbright  
 1859 Cossar, Robert, Dunbar  
 1874 Costine, John, of Lochvale, Dumfries  
 1864 Cotesworth, Robert, Cowdenknowes, Melrose  
 1873 Coubro, John, Hawkhill, Kincardine-on-Forth  
 1857 Coubrough, A., Biggarshields, Biggar  
 1832 Coubrough, J., Blairtummock, Lennox-town  
 1859 Coupar, John, Balrownie, Brechin  
 1869 Couper, Jn. Cardno, of Craigiebuckler, Aberdeen  
 1865 Cousin, George, 12 Royal Exchange, Edinburgh  
 1864 Cousland, James, Banker, Denny  
 1858 Coutts, William, Sandlaw, Banff  
 1844 Coventry, Andrew, of Pitiloch, 29 Moray Place, Edinburgh  
 1864 Coventry, Wm., Pleasance, Aberdour  
 1871 Cowan, Dr Alex., East Morningside House, Edinburgh  
 1857 Cowan, Andrew, Spittalhill, Fintry  
 1836 Cowan, C., of Logan House, Penicuik  
 1860 Cowan, Charles W., yr. of Logan House, Penicuik  
 1869 Cowan, George, Mains of Park, Glen-luce  
 1872 Cowan, George, Valleyfield, Penicuik  
 1873 Cowan, James, 10 North Queen Street, Glasgow

## Admitted

- 1874 Cowan, James, M.P., 35 Royal Terrace, Edinburgh  
 1858 Cowan, Jn., of Beeslack, Milton Bridge  
 1857 Cowan, Peter, Lurg, Fintry  
 1854 Cowan, Richard, St Kilda, Sidmouth. Devon  
 1861 Cowan, Robert, W.S., Edinburgh  
 1862 Cowan, Robert, Park Mains, Paisley  
 1872 Cowan, William, Banker, Alva  
 1870 Cowe, George, Balhousie, Carnoustie  
 1872 Cowe, Peter, Lochton, Coldstream  
 1870 Cowe, Robert, Old Castles, Chirnside  
 1872 Cowe, William, Butterdean, Grants House  
 1868 Cowie, Alexander, Darley, Auchterless, Turriff  
 1853 Cowie, Alexander, Crombly Bank, Ellon  
 1852 Cowie, James, Sundridge Hall, Bromley, Kent  
 1870 Craig, Daniel, Barr, Sanquhar  
 1855 Craig, David, 4 Pitt Street, Portobello  
 1878 Craig, D. B., Mount Pleasant, Thurso  
 1850 Craig, James, 33 Manor Place, Edinburgh  
 1857 Craig, J., of Craigdarroch, New Cumnock  
 1863 Craig, James H. Gibson, yr. of Riccarton, Currie  
 1857 Craig, John, Guelst, Cumnock  
 1867 Craig, John, Jellyhill, Bishopbriggs  
 1857 Craig, John, Littlehill, Bishopbriggs  
 1872 Craig, John, Whitehill, Kelso  
 1860 Craig, Josh., of Threecrofts, Lochrutton  
 1870 Craig, Robert, Airdrie, Kirkbean  
 1867 Craig, Robert, Auchentiber, Greenock  
 1868 Craig, Robert, Jamaica  
 1824 CRAIG, Right Hon. Sir William Gilson, of Riccarton, Bart., Currie—  
*Treasurer of the Society*  
 1859 Craig, William, Solicitor, Dumfries  
 1870 Craig, Wm., Buckley, Bishopriggs  
 1855 Craig, William C., Anneston, Biggar  
 1862 Craig, W., Craig Villa, New Cumnock  
 1873 Craighead, James, Sillyflat, Bervie  
 1858 Craigie, Wm. Roper, Tom an Droighne, Ballinluig  
 1863 Craike, Charles, late Esbie, Lochmaben  
 1871 Cran, John, Kirkton, Inverness  
 1875 Cran, Robert, Fingask Mains, Beauly  
 1857 Cranston, J., Pathhead, Cockburnspath  
 1872 Cranston, Jas., Holystone, Thornhill  
 1849 Cranstoun, George Cranstoun Trotter, of Dewar, Harvieston, Gorebridge  
 1859 Cranstoun, William S., Dyke, Moffat  
 1850 Crawford, Adam, Royal Terrace, Edinburgh  
 1853 Crawford, Alexander, Writer, Dunse

## Admitted

- 1871 Crawford, Andrew, Pitlowie, Glen-carae  
 1822 Crawford, Charles, late East Fortune  
 1860 Crawford, D., Dykehill, Milton of Campsie  
 1855 Crawford, James Coutts, of Overton, Strathaven  
 1854 Crawford, John, The House of Tongue, Lairg  
 1865 Crawford, John, Milnstonford, West Kilbride  
 1857 Crawford, P., Dumgoyack, Strathblane  
 1860 Crawford, William, Bargarvie, Perth  
 1867 Crawford, Muir, 6 Bank Street, Leith  
 1866 Crawford, R., Balbougie, Inverkeithing  
 1838 Crawford, W. S. Stirling, of Milton, Glasgow  
 1866 Crease, Wm., 6 George Square, Edinburgh  
 1875 Crerar, Donald, Auchnauld, Glenquach, Dunkeld  
 1861 Crerar, John, Delvine, Dunkeld  
 1850 Creyk, Dr A., Dalvey, Advie, Strath-  
 1838 Crichton, Hew, S.S.C., Edinburgh  
 1849 Crichton, Hew Hamilton, W.S., Edinburgh  
 1847 Crichton, James Arthur, Advocate, Sheriff of Fife  
 1849 Crichton, John, of Lynn, Dalry, Ayr  
 1872 Crichton, John J. F., Dykehill, Milton of Campsie  
 1859 Crichton, William, Live Stock Agent, Haddington  
 1870 Critchley, J. A., Stapleton Tower, Annan  
 1872 Croall, John, Coach Works, Kelso  
 1875 Croall, Robert, Job and Postmaster, Craigercock Castle, Edinburgh  
 1835 Crombie, A., of Thornton, Laurencekirk  
 1858 Crombie, Alex., yr. of Thornton, W.S., Thornton Castle, Laurencekirk  
 1870 Gromarty, William, Widewall, St Margaret's Hope  
 1845 Cross, David, Seed Merchant, Glasgow  
 1852 Cross, Robert, Musselburgh  
 1865 Crossman, M. G., Bridgend, Berwick  
 1858 Cruickshank, Amos, Sittyton, Abur-  
 1868 Cruickshank, Andw., Conland, Huntly  
 1847 Cruickshank, Anthony, Aberdeen  
 1868 Cruickshank, Edward, Lethenty, Inverurie  
 1874 Cruickshank, George, Ardmore, Tain  
 1852 Cruickshank, George, Comisty, Huntly  
 1871 Cruickshank, John, Barmuckity, Elgin  
 1852 Cruickshank, John, Kock, New Spynie, Elgin

Admitted

- 1865 Cruickshank, Wm., Milton of Brachlich, Fort-George Station  
 1865 Crum, Alexander, Roukin, Thornliebank, Glasgow  
 1868 Cumming, George, Writer, Banff  
 1865 Cumming, Henry Gordon, Pittyvaich, Dufttown  
 1874 Cumming, James, Allanfearn, Inverness  
 1857 Cumming, Robert Crawford, 2 Gloucester Place, Edinburgh  
 1874 CUMMING, Sir William G. Gordon, of Altyre, Bart., Forres  
 1850 Cuninghame, D., Chapelton, Ardrossan  
 1857 Cunliff, Richard Steedman, Carlton House, Stirling  
 1867 Cuninghame, Captain John, of Balgownie, Culross, Alloa  
 1854 Cunningham, A. G., Rosebank, Currie  
 1863 Cunningham, C. R., Grahamslaw, Kelso  
 1870 Cunningham, C., V.S., Slateford  
 1872 Cunningham, C. J., The Tofts, Morebattle, Kelso  
 1873 Cunningham, David, Freugh, Stranraer  
 1864 Cunningham, J., Tarbreoch, Dalbeattie  
 1872 Cunningham, James, Factor, Coldstream  
 1866 Cunningham, J. Barré, of Hensol, Castle-Douglas  
 1864 Cunningham, J. C., 102 West Bow, Edinburgh  
 1852 Cunningham, John Sinclair, 102 West Bow, Edinburgh  
 1867 Cunningham, John, Trees, Maybole  
 1857 Cunningham, J., Whitecairn, Dalbeattie  
 1864 Cunningham, J. M., Assistant-Manager Clydesdale Banking Company, Glasgow  
 1851 Cunningham, T., Dallachy, Aberdeen  
 1836 Cunningham, W. A., of Logan, Cumnock  
 1857 Cunningham, William, Hole, Lennoxtown  
 1859 Cunningham, W. C. S., of Caprington, Kilmarnock  
 1867 CUNNYNGHAM, Sir Robert K. A. Dick, of Prestonfield, Bart., Edinburgh  
 1871 Curr, Henry, Factor, Pittkeltony, Muthill  
 1870 Currie, David, of Craigshields, Moffat  
 1853 Currie, James, Halkerston, Gorebridge  
 1872 Currie, James J., Yorkston, Gorebridge  
 1863 Currie, Wm., of Linthill, Lilliesleaf  
 1854 CURRIEHILL, Hon. Lord, Curriehill, Currie  
 1849 Curror, Adam, The Lee, Edinburgh

Admitted

- 1867 Curror, David, of Wester Craigduckie, Edinburgh  
 1848 Curror, John, of Nivingston, Comiston, Lothian Burn  
 1869 Curror, John F., Myreside, Edinburgh  
 1873 Curror, Patrick Robert, The Lee, Edinburgh  
 1872 Curror, Peter, Coxithill, Stirling  
 1836 Cuthbertson, Wm., Merchant, Glasgow  
 1874 Dahl, Ferdinand August, Director of the Royal Higher Agricultural School at Aas, Christiania—*Honorary Associate*  
 1841 Dalgairns, Lieut.-Colonel, Balgersho, Coupar-Angus  
 1857 Dalgleish, Captain James Ogilvie, of Woodburne, Cupar Fife  
 1857 Dalgleish, John J., of Ardnamurchan, 8 Athole Crescent, Edinburgh  
 1858 Dalgleish, L., of Dalbeath, 8 Athole Crescent, Edinburgh  
 1857 Dalglisch, Robert, of Kilmardinny, Glasgow  
 1853† DALKEITH, Right Hon. the Earl of, M.P., Eildon Hall, Newtown St Boswells  
 1874 Dallas, A. G., 3 Ennismore Gardens, Princes Gate, London, S.W.  
 1862 Dalrymple, Charles, of Hailes, M.P., 39E Onslow Square, London, S.W.  
 1868 Dalrymple, C. Elphinstone, of Kinellar Lodge, Blackburn, Aberdeen  
 1865 DALRYMPLE, Hon. G. Grey, Elliston House, St Boswells  
 1841 DALRYMPLE, Sir Hew, of North Berwick, Bart., Luchie, North Berwick  
 1857 Dalrymple, James, of Woodhead, Kirkcaldy  
 1859 Dalrymple, Jas., of Langlee, Galashiels  
 1866 DALVELL, Sir R. A. O., of Binns, Bart.  
 1835 Dalzell, James Allen, North Berwick  
 1860 Dalziel, Alex., Glenwharrie, Sanquhar  
 1860 Dalziel, George, Merkland, Thornhill  
 1870 Dalziel, Geo., Auchengruth, Sanquhar  
 1873 Dalziel, George, W.S., Edinburgh  
 1869 Dalziel, James, Tinwaldshaws, Dumfries  
 1857 Darling, Adam, Governor's House, Berwick  
 1863 Darling, J. Stormonth, of Lednathie, W.S., Edinburgh  
 1863 Darling, T., Mordington Mains, Berwick  
 1839 Darling, Wm., Priestlaw, Cranshaws  
 1865 Darroch, D., of Gourrock, 5 Beaufort Gardens, London, S.W.  
 1855 Davidson, Alex., Mains of Cairnbrogie, Tarves  
 1872 Davidson, And., Brewer, Coldstream  
 1824 Davidson, Dun., of Tulloch, Dingwall

Admitted	Admitted
1864 Davidson, Duncan H. C. R., yr. of Tulloch, Inverbroom, Dingwall	1859 Dickson, James, Dyemill, Moffat
1847 Davidson, George, Dean Park, Balerno	1850 Dickson, James J., C.A., 13 Clarendon Crescent, Edinburgh
1860 Davidson, George, Walton, Linlithgow	1858 Dickson, James A., Banker, Arbroath
1870 Davidson, Gilbert, Banker, Hawick	1862 Dickson, J. H., of Corstorphine, Saughton Mains, Edinburgh
1848 Davidson, H., of Muirhouse, Davidson's Mains, Edinburgh	1846 Dickson, John, W.S., Perth
1841 Davidson, Henry M., Sheriff-Clerk, Haddington	1870 Dickson, Alex., of Hartree and Kilbucko, M.D., Professor of Botany, University of Glasgow
1870 Davidson, Hugh, Procurator-Fiscal, Braedale, Lanark	1858 Dickson, John F., Panbride House, Carnoustie
1864 Davidson, J., Land Steward, Crathes Castle, Banchory	1870 Dickson, R. A., Merchant, Dumfries
1874 Davidson, Lachlan, Caledonian Bank,	1860 Dickson, T., Drumcruil, Thornhill
	1871 Dickson, Dr Walter G., 3 Royal Circus, Edinburgh
1834 Davidson, P., of Inchmarlo, Aberdeen	1874 Dickson, W. L., Drummelzier Haugh, Biggar
1865 Davidson, Robert, Mayfield, Inverness	1851 Dingwall, William, Ramornie, Ladybank
1872 Davidson, Wm., Colmslie, Galashiels	1863 Dinning, John, The Terrace, Belford
1850 Davidson, Wm. J., of Ruchill, Glasgow	1860 Dirom, Col. Thomas Pasley, of Mount Annan, Annan
1866 Davidson, W. G., of South Fod, Bogie House, Kirkcaldy	1849 Dixon, Thomas G., Nant Hall, Rhyl
1848 DAVE, Sir H. R. F., of Creedy, Bart., M.P., Crediton, Devon	1866 Dobbie, John, Campend, Dalkeith
1859 Dawson, John, Swinton Bridge End, Coldstream	1862 Dobie, David, Tinwald House, Dumfries
1864 Dawson, Wm., Warriston, Hermiston	1863 Dodd, Nicholas, Nisbet, Kelso
1857 Deans, J. Y., of Kirkstyle, Kilmarnock	1863 Dodd, James, Mossburnford, Jedburgh
1850 Deans, Peter D., Mount Charles, Portobello	1887 Dodd, William, Merchant, Glasgow
1838 DEAS, Hon. Lord, 32 Heriot Row, Edinburgh	1857 Doddrell, George J., Glasgow
1823 Dempster, G., Ormiston Hall, Tranent	1865 Dodds, James, Moncrieffe Bank, Perth
1857 Dempster, G. H., of Dunnichen, Forfar	1844 Dodds, J., Cranston Riddell, Dalkeith
1854 Denholm, Alex., Baitlows, Biggar	1863 Dodds, William, Elwartlaw, Greenlaw
1850 Dennistoun, Alex. H., Glasgow	1871 Doe, John, Agricultural Implement Maker, Errol
1832 Dewar, Lieut.-Col. A. C., of Vogrie, Ford	1858 Don, Alexander, Keirsbeath, Dumfermline
1864 Dewar, A., Arnprior, Kippen, Stirling	1858 Donald, Jas., North Town, Cullerlie, Echt
1872 Dewar, David, Shaw of Touch, Stirling	1873 Donald, John, Anquhirie, Stonehaven
1860 Dewar, G. Innes, United Service Club, Edinburgh	1845 Donaldson, James, of Keppoch, Cardross
1873 Dewar, James, Cairnston, Dunblane	1871 Donne, Henry, Leek Wootton, Warwick
1872 Dewar, James, 9 Alston Street, Glasgow	1865 Dougall, Adam, Stewarton, Kirkcinner
1873 Dewar, John, Doune Castlefarm, Doune	1865 Dougall, Andrew, Railway Manager, Inverness
1861 Dewar, John, Wine Merchant, Perth	1857 Dougall, Admiral W. H. Maitland, of Scotsraig, R.N., Tayport
1864 Dewar, Peter, King's Park, Stirling	1868 Douglas, Archibald C., of Mains, Milngavie
1864 Dewhurst, G. C., of Aberuchil, Comrie	1868 Douglas, Arthur Henry Johnstone, of Lockerbie
1856 Dick, Dr John, late Broombank, Mid-Calder	1858 Douglas, Bentlem, Peffer Mill, Liberton
1868 Dick, Wm., of Tullymet, Ballinluig	1839 Douglas, F. B., Advocate, Edinburgh
1859 Dickenson, Wm., Longcroft, Lauder	1851 DOUGLAS, Sir Geo. H. S., of Springwood Park, Bart., M.P., Kelso
1857 Dickie, John, Seedsman, Kilmarnock	1873 Douglas, J. H. S., yr. of Springwood Park, Kelso
1869 Dickie, Joseph, Union Bank, Dunkeld	
1867 Dickie, Robt., Killeonan, Campbeltown	
1870 Dickie, Wm., Balgerran, Castle-Douglas	
1869 Dickinson, George T., of Wheelbirks, Newcastle-on Tyne	
1848 Dickson, Alex., Hermiston, Edinburgh	
1854 Dickson, Archibald, Buchtrig, Coldstream	

Admitted

- 1867 Douglas, George Sholto, Riddletonhill, St Boswells  
 1863 Douglas, James, of Cavers, Hawick  
 1866 Douglas, E. O., of Killiechassie, Aberfeldy  
 1869 Douglas, John, Calrossie, Nigg, Ross-shire  
 1873 Douglas, John, Gartartan Cottage, Gartmore  
 1861 Douglas, Thomas, Clyth, Lybster  
 1872 Douglas, Thos., Swinside Townhead, Jedburgh  
 1871 Douglas, George, Upper Hindhope, Jedburgh  
 1874 Douglas, Rev. Geo. Robinson, of Orchardton, Castle-Douglas  
 1874 Douglas, William, Arboll, Tain  
 1854 Douglas, Alex. Forbes, Haddo House Mains, Aberdeen  
 1864 Douie, John R. L., Factor, Polmaise, Stirling  
 1853 Dove, John, Crosshall, Coldstream  
 1871 Dowall, Charles, Kelly Bleachfield, Arbroath  
 1858 Dowell, Alex., 13 Palmerston Place, Coates, Edinburgh  
 1873 Downie, George, Balcomie, Crail  
 1869 Downie, Hay, Corstorphine  
 1838 Downie, John, Merchant, Glasgow  
 1867 Downie, Wm., Linton Mains, Cluny, Aberdeen  
 1857 Drennan, James, Auchinlee, Ayr  
 1872 Drever, James, South Uist, Lochmaddy  
 1870 Drew, James, of Craigenallie, Doonhill, Newton-Stewart  
 1850 Drew, Lawrence, Merryton, Hamilton  
 1857 Drife, James, New Zealand  
 1861 Dron, William, Crieffvechter, Crieff  
 1861 DRUMMOND, Hon. Francis, 58 St George's Square, London, S.W.  
 1835 Drummond, G. S. Home, of Blair-Drummond, Stirling  
 1873 Drummond, James, jun., Blacklaw, Dunfermline  
 1859 Drummond, Henry, Seedsman, Stirling  
 1864 Drummond, John, of Balquhandy, Guiton Rectory, Wingham, Kent  
 1871 Drummond, John, of Blackruthven, Perth  
 1852 Drummond, J. M., of Megginch, Errol  
 1875 Drummond, Robert, Pocknave, Craigie, Kilmarnock  
 1828 Drummond, Thos., of Craigie, Dundee  
 1870 Drummond, W. P., 52 George Street, Edinburgh  
 1858 Drybrough, Thos., 40 Drummond Place, Edinburgh  
 1869 Dryburgh, J., Kininmonth, Cupar-Fife  
 1863 Dryden, W., Land-Steward, Springwood Park, Kelso

Admitted

- 1871 Drysdale, Alex., S. St Andrew Street, Edinburgh  
 1873 Drysdale, David, Lorns Hill, Alloa  
 1864 Drysdale, Henry, Mains of Aberdalgie, Perth  
 1873 Drysdale, Robert, Old Mills, Craigforth, Stirling  
 1861 Drysdale, Wm., of Kilrie, North Pitt-eadie, Kinghorn  
 1868 Duckering, R. E., Northorpe, Kirton Lindsey  
 1870 Dudgeon, Alex., East Dalmeny, Edinburgh  
 1869 Dudgeon, George, Almondhill, Kirkliston  
 1850 Dudgeon, James, Upper Keith  
 1840 Dudgeon, John, 8 Tavistock Square, London  
 1862 Dudgeon, J. S., Longnewton, St Boswells  
 1856 Dudgeon, John B., Crakaig, Golspie  
 1851 Dudgeon, Patrick, of Cargen, Dumfries  
 1843 DUDLEY, Right Hon. the Earl of  
 1866 DUFF, Hon. George Skene, Montcoffer House, Banff  
 1874 Duff, George Smyttan, Sanquhar House, Forres  
 1868 Duff, Col. James, Knockleith, Turriff  
 1865 Duff, James, Melgund, Forfar  
 1858 Duff, Lachlan Duff Gordon, of Drummuir, Keith  
 1866 Duff, Robert W., of Fetteresso, M.P., Stonehaven  
 1874 Duff, Thomas, of Garth, Alerfeldy  
 1858 Duguid, P., of Cammachmore, Aberdeen  
 1863 Dun, John, Gilston Lodge, Dalkeith  
 1871 Dun, John, jun., Galashiels  
 1873 Dun, Peter, Kippill Villa, Kippert  
 1839 DUNBAR, Sir Archd., of Northfield, Bart., Duffus House, Elgin  
 1839 DUNBAR, Sir G., of Hempriggs, Bart., Wick  
 1845 DUNBAR, Sir William, of Mochrum, Bart., Newton-Stewart  
 1851 Duncan, Alex. (of Providence, Rhode Island), Knossington Grange, Oakham, Rutland  
 1857 Duncan, Alex., Pusk, Leuchars  
 1864 Duncan, Alex., of Glencarron, Denny  
 1872 Duncan, Charles, Woodend, Rothesay  
 1858 Duncan, D. H., Friock Mains, Arbroath  
 1843 Duncan, George, The Vine, Dundee  
 1863 Duncan, James, Killichoan, Pitlochry  
 1869 Duncan, James, Panlathie Mill, Carnoustie  
 1871 Duncan, James, of Kilmun, Benmore, Greenock  
 1871 Duncan, John, yr. of Kinkell, Boghall, St Andrews  
 1858 Duncan, John, Ardo, Methlic

Admitted	Admitted
1855 Duncan, Robert, of Kirkmay, Crail	1873 Edmond, William, Hillhead of Catter, Drymen
1868 Duncan, R., Auchenbaidie Mains, Banff	1858 Edmonds, Leonard, London
1848 Duncan, William, S.S.C., Edinburgh	1869 Edmondston, D. C., Ordale, Balta-sound, Unst, Lerwick
1868 Duncan, W. J., National Bank, Edinburgh	1873 EDMONSTONE, Admiral Sir Wm., of Dun treath, Bart., M.P., Colzium, Kilsyth
1828 DUNDAS, Sir David, of Dunira, Bart., Crieff	1859 Edwards, Matthew, late Hilton, Alloa
1847 Dundas, Robert, of Arniston, Gore-bridge	1865 Edwards, Dr J., Birchfield, Abernethy, Grantown
1860+DUNGLASS, Right Hon. Lord, The Hirsell, Coldstream	1863 EGLINTON and WINTON, Right Hon. the Earl of, Eglinton Castle, Irvine
1857 Dunlop, Alexander, Glasgow	1847 ELCHO, Right Hon. Lord, M P., Gosford, Haddington
1869 Dunlop, Gabriel, Castle Farm, Stewarton	1863 Elder, George, of Knock Castle, Wemyss Bay
1849 Dunlop, George, late Edinburgh	1854 Elder, James, Whitehill Mains, Musselburgh
1872 Dunlop, George, junior, 14 Hill Street, Edinburgh	1854 Elder, Thomas, Wedderburn Mains. Edrom
1844 Dunlop, James, of Arthurlee, Barrhead	1872 Elder, William, Implement Maker, Berwick-on-Tweed
1859 Dunlop, J., Queen's Hotel, Kirn, Dunoon	1873 Eley, William Henry, Islingham. Frindsbury, Rochester. Kent— <i>Free Life Member</i>
1871 Dunlop, Robert, Aulton, Kilmaurs	1874 ELTBANK, Right Hon. Lord, Darnhall. Eddleston
1853 Dunlop, William H., of Annanhill, Kilmarnock	1836 Ellice, Edward, of Glengarry and Glenquoich, M.P., 28 Grosvenor Square, London
1862+DUNMORE, Right Hon. the Earl of, Dunmore Park, Stirling	1869 Elliot, A. T., Newhall, Galashiels
1854 Dunn, Adam, Tranent Mains, Tranent	1863 Elliot, Henry, Greenriver, Hawick
1858 Dunn, A., Wester Leochel, Craigievar	1853 Elliot, James, Galalaw, Kelso
1863 Dunn, David, 33 Rock Park, Liverpool	1871 Elliot, James Scott, Blackwood, Dumfries
1853 Dunn, William, Redden, Kelso	1854 Elliot, John, Primrosehill, Dunse
1858 Durie, David, Nether Mill, Fettercairn	1863 Elliot, John, of Binks, Burnmouth, Newcastleton
1855 Durie, Robert Hogg, Barney Mains, Haddington	1863 Elliot, John. The Flat, Newcastleton
1874 Durno, James, Jackston, Rothienorman	1874 Elliot, Matthew, Flesher, Inverness
1868 Durno, John, Lambhill, Inch	1848 Elliot, Robert. Laighwood, Dunkeld
1874 Durno, John, Sunnyside, Rothienorman	1874 Elliot, Robt. Henry, of Clifton Park. Kelso
1847 Duthie, Alex., of Ruthrieston, 6 Great King Street, Edinburgh	1852 Elliot, Thomas, Hindhope, Jedburgh
1868 Duthie, William, Banker, Tarves	1854 Elliot, Thomas, Blackhall, Galashiels
1869 Dykes, John, jun., 79 St Vincent Street, Glasgow	1873 Elliot, Thomas John, Langley Park. Norwich— <i>Free Life Member</i>
1832 Dyson, Thos. C., of Willowfield, Halifax, Yorkshire	1861 ELLIOT, Sir Walter. of Wolflee. K.C.S.I.. Hawick
1871 Easson, David, Camperdown, Dundee	1860 Elliot, Walter, Holybush, Galashiels
1860 Easson, Robt., Scones Lethendy, Perth	1866 Elliot, Walter, Hermitage, Newcastleton
1865 Eden, Right Rev. Bishop, Hedgefield House, Inverness	1872 Elliot, Wm., of Benrig, St Boswells
1871 Eden, Henley, Factor, Aberdalgie House, Perth	1872 Elliot, William, Perth Brewery, Perth
1874 Edgar, John, Kirkettle, Roslin	1871 Ellison, Ralph Carr, of Dunstan Hill. Gateshead
1871 Edgeley, Robert, Gilmerton, Edinburgh	1860 ELPHINSTONE, Right Hon. Lord. Carberry Tower, Musselburgh
1857 Edgeley, Thomas, Gilmerton, Edinburgh	1867 ELPHINSTONE, Hon. Edward Charles Buller, Carnock House. Larbert
1864 Eddington, Peter, Pitkellony, Muthil	
1863 Edmiston, Hugh Fleming, Yoker Mains, Yoker	
1869 Edmond, David, of Ballochruin, Balforn	
1873 Edmond, Wm., Cowie, Bannockburn	



Admitted	Admitted
1868 ELPHINSTONE, Hon. George James, Innerhadden, Pitlochry	1852 Farquharson, James, Banker. Auchinblae
1840 ELPHINSTONE, Sir James D. H., of Horn and Logie Elphinstone, Bart., M.P., Pitcaple	1871 Farquharson, James, East Town, Tarland
1827 Elphinstone, Lieutenant-Colonel John	1843 Farquharson, Major-General Francis
1841 Errington, Rowland, of Sandhoe, Northumberland	1857 Farquharson, Robert O., of Haughton, Alford
1854 ERROL, Right Hon. the Earl of, Slains Castle, Ellon	1858 Farrell, Alfred Herbert William, Davo House, Fordoun
1874 Erskine, Henry, Dalladies, Brechin— <i>Free Life Member</i>	1857 Farrell, M., of Woodburnden, Fordoun
1862 Erskine, H. D., of Cardross, Stirling	1874 Fell, John Duncan, Secretary Stormont Union Agricultural Society, Blairgowrie
1862 Erskine, J. E., of Linlathen, Broughty Ferry	1863 Fender, Robt., Northfield, Coldingham
1859 Erskine, Vice-Admiral John E. The Albany, London	1843 Fenton, John, Mill of Mains, Dundee
1849 Erskine, James of Shieldfield, the Priory, Melrose	1872 Fenwick, James. Leadketty, Dunning
1860 ERSKINE, Sir Thomas, of Cambo, Bt., St Andrews	1871 Fenwick, James, Factor, Redgorton. Perth
1873 Eskdale, John, Muirdean, Kelso	1874 Fergus, William, Craigour, Liberton
1858 Ewing, Robert. West Town, Tarland	1871 Ferguson, Lieut.-Col. George A. of Pitfour, Mintlaw
1844 Ewing, Alexander, 9 Claremont Terrace, Glasgow	1824 Ferguson, John, of Knockindale
1857 Ewing, Alex. Crum, yr. of Strathleven. Polmont Park, Falkirk	1863 Ferguson, John, Burghlee, Loanhead
1851 Ewing, Arch. Orr, of Ballikinrain, M.P., Killearn	1855 Ferguson, John, East Grange, Forres
1857 Ewing, Humphrey Ewing Crum, of Strathleven, Ardencaple Castle, Helensburgh	1860 Ferguson, John, Brae of Coynach. Mintlaw
1838 Ewing, John Orr, Glasgow	1846 Ferguson, J., of Kilquhanity, Dalbeattie
1868 Fair, Frederick, St Andrews	1870 Ferguson, John, Seed Merchant, Sanquhar
1863 Fair, John S. Elliot, Wells, Jedburgh	1858 Ferguson, Thomas, Kinnochtry, Coupar-Augus
1864 Fairholme, Geo. K. Erskine, of Old Melrose, Melrose	1868 Ferguson, Thomas, Alton of Coynach, Mintlaw
1850 Fairie, James, of Farme, Glasgow	1836 Ferguson, Samuel R., of Middlehaugh, St Andrews
1831 Fairrie, John, Merchant, London	1870 Ferguson, Wm., of Kinmundy, Mintlaw
1858 Falconer, Don., Milton of Conon, Arbroath	1854 FERGUSON, Right Hon. Sir James. of Kilkerran, Bart., Maybole
1851 Falconar, Peter. 70 High Street, Old Aberdeen	1870 Ferme, Charles, Blackhall, Kincardine-on-Forth
1873 Falconer, William, Candy, Drumlithie	1869 Ferme, George, 10 Manor Park, Blackheath, London
1849 FALSHAW, Right Hon. James, Lord Provost of Edinburgh, 14 Belgrave Crescent	1875 Fernie, James A., Hilton, Alloa
1860 Farish, Samuel, Kirklands, Lockerbie	1853 Fernie, John C., Union Club, S Andrews
1852 Farquhar, Arthur, of Elsick, W.S., 6 Bon-Accord Square, Aberdeen	1850 Fettes, James, Surgeon, Laurencekirk
1850 Farquharson, F., of Finzean, 5 Eton Terrace, Edinburgh	1864 Field, Rev. Edward Burch, of Moreland, Edinburgh
1856 Farquarson, F., Builder, Haddington	1864 Field, James Hamilton, yr. of Moreland, Edinburgh
1874 Farquharson, James O., Banchor, Kinnussie	1869 Field, Sydney, Aberdeen
1865 Farquharson, James Ross. of Invercauld, Braemar	1840† FIFE, Right Hon. the Earl of, K.T.. Duff House, Banff
1865 Farquharson, J., New Market, Aberdeen	1857 Findlay, Lieut.-Colonel John, Woodbank, Dumbarton
	1873 Findlay, Chas. Bannatyne, of Boturich, Dumbarton
	1855 Findlay, Robert, of Springhill, Bailieston, Glasgow
	1847 Findlay, T. Dunlop, of Easterhill Glasgow

## Admitted

- 1857 Findlay, W., Brackenbrae, Bishopbriggs  
 1844 Finlay, A. S., of Castle Toward, Greenock  
 1859 Finlay, John, Lochend, Lochgelly  
 1869 Finlay, John H., W.S., 52 Frederick Street, Edinburgh  
 1870 Finlay, Kirkman, of Dunlossit, Portaskaig, Islay  
 1875 Finlayson, Benjamin, 54 Broomielaw, Glasgow  
 1865 Finnie, Archibald, Spinghill, Kilmarnock  
 1870 Finnie, C. J. Macara. Swanston, Lothian Burn  
 1874 Finnie. Wm., of Newfield, Kilmarnock  
 1874 Fisher, Arthur William, Hedgefield, Inverness  
 1873 Fisher, Donald, Gartenkeir, Tillicoultry  
 1861 Fisher, Donald, The Hotel, Pitlochry  
 1873 Fisher, Henry, Hotel-keeper, Castleton, Braemar  
 1871 Fisher, John. The Loaning, Dunkeld  
 1870 Fisher, John, Knells, Carlisle  
 1852 Fleming, L., Mains of Fullwood, Paisley  
 1867 Fleming, David, Aronmill, Hamilton  
 1861 Fleming, Alexander, Raith, Rothwell  
 1860 Fleming, Geo., Crofthead, Mid-Calder  
 1857 Fleming, James, Coats, Penicuik  
 1854 Fleming, James, Three-Mile-Town, Linlithgow  
 1864 Fleming, James, Carmuir, Falkirk  
 1864 Fleming, J. N., of Knockdon, 15 Chorlton Street, Manchester  
 1857 Fleming, John, Marionburgh, Ballindalloch  
 1857 Fleming, John, Hawkwood, Strathaven  
 1865 Fleming, J., 18 Leadenhall Street, London  
 1870 Fleming, John, Meadowbank Cottage, Strathaven  
 1857 Fletcher, Archibald, Tyndrum  
 1870 Fletcher, Bernard Jas. C., of Somerton Hall, Norfolk  
 1848 Fletcher, Major C. E., late of Corsock  
 1865 Fletcher, James, of Rosehaugh, Avonh  
 1857 Fletcher, J., yr. of Salton. Tranent  
 1872 Flint, Alex., Nether Mains, Chirnside  
 1869 Flint, David, Drylaw Mains, Davidson's Mains  
 1861 Flockhart, J., Banker, Colinsburgh  
 1861 Flockhart, W., Flockhouse, Kinross  
 1865 Foggo, Robert Gordon, Invercauld Office, Ballater  
 1872 FORBES, Right Hon. Lord, Castle Forbes, Keig  
 1850 Forbes, Arthur, of Culloden, Inverness  
 1828 FORBES, Sir Charles, of Newe and Edinglassie, Bart., Strathdon

## Admitted

- 1868 Forbes, Charles D., Tochieneal, Cullen  
 1836 Forbes, Charles Henry, of Kingarloch, Fortwilliam  
 1856 Forbes, Charles William, late Moniach Castle, Inverness  
 1870 Forbes, Chas. W. L., Aberfeldy  
 1874 Forbes, D. Geo., of Millburn, Inverness  
 1830 Forbes, George, Merchant, London  
 1865 Forbes, Duncan, of Leanach, Culloden, Inverness  
 1830 Forbes, James Stewart, Edinglassie, Strathdon  
 1862 Forbes, James Ochonar. of Corse, Lumphanan  
 1874 Forbes, James, Tombreck, Glenbucket. Aberdeen  
 1842 Forbes, Major-General John, of Inverernan. C.B., Strathdon  
 1850 Forbes, John, of Haddo, Huntly  
 1872 Forbes, John, Pittelachie, Coldstone, Tarland  
 1834 Forbes, P., of St Catherine's, Edinburgh  
 1873 Forbes, Robert, Auctioneer, Stirling  
 1857 FORBES, Sir William of Cragievar, Bart., Fintray House, Aberdeen  
 1835 Forbes, W., of Medwyn, Edinburgh  
 1860 Forbes, William, of Callendar, Falkirk  
 1874 Forbes, William Forbes, of Lochcote, Bathgate  
 1872 Forbes, William, Ruthven, Coldstone, Tarland  
 1849 Ford, William, Hardengreen, Dalkeith  
 1868 Fordyce, James Dingwall, of Culsh, Advocate, Edinburgh  
 1868 Fordyce, Wm., Dingwall, of Brucklay, M.P., Mintlaw  
 1871 Forgan, Andrew, Inch, Pittenweem  
 1873 Forgan, James, jun., Sunnybraes, Leven  
 1838 Forlong, William, of Erins, Tarbert  
 1831 Forman, Jn Nairne, W.S., Edinburgh  
 1863 Forman, John, 51 Great King Street, Edinburgh  
 1852 Forman, Robt., Keith House, Upper Keith  
 1873 Forrest, Abram, of Calderhead, Auldhouseburn, Muirkirk  
 1857 Forrest, David, of Treesbanks, Shotts  
 1848 Forrest, James, jun., Kirriemuir  
 1870 FORREST, Sir John, of Comiston, Bart.  
 1867 Forrest, John Clark, of Auchendraith, Hamilton  
 1863 Forrest, Peter, Banker, Shotts  
 1863 Forrest, William, of Lawmur, Allanton, Hamilton  
 1842 Forrester, John, W.S., Edinburgh  
 1851 Forrester, Wm., 16 Northumberland Street, Edinburgh  
 1865 Forsyth, David, Town Clerk, Elgin

Admitted

- 1863 Forsyth, George, Ashybank, Hawick  
 1872 Forsyth, Jas. (Hooper & Co.), Kelso  
 1874 Forsyth, Jas. Noel Muller, of Quinish, Mull  
 1855 Forsyth, John, Factor for Balnagown, Bellevue, Parkhill  
 1874 Forsyth, William Banks, of the *Inverness Advertiser*, Inverness  
 1873 Fortescue, Archer, of Swanbister, Kingcausie, Aberdeen  
 1857 Fortune, George, Barnsmuir, Crail  
 1854 Fortune, William R., of Muircambus, Colinsburgh  
 1869 Foulis, Sir James Liston, of Colinton, Bart., Millburn Tower, Corstorphine  
 1870 Foulds, James, Cavens, Dumfries  
 1861 Foulis, Robert, M.D., Carnie Lodge, Cupar-Fife  
 1846 Fowler, Henry Mackenzie, of Raddery, Fortrose  
 1874 Fowler, William, of Asleed, Turriff  
 1849 Fox, Michael, jun., late Glencorse Mains, Penicuik  
 1838 Fox, Richard M., of Foxhall, Rathowen, Ireland  
 1870 Fox, Wm., the Abbey, St Bees  
 1857 Foyer, David, Knowehead, Campsie  
 1872 France, C. S., Bank House, Penicuik  
 1867 France, Robert, Lowan Bank, Bridge of Allan  
 1874 France, Thomas, Ironmonger, Maybole  
 1874 Fraser, Alex., Barrisdale, Inverness  
 1857 Fraser, Alexander, Faillie, Inverness  
 1868 Fraser, Alex. (Neill & Co.), Edinburgh  
 1865 FRASER, Col., the Hon. A. E., Eilan Aigeas, Beaulieu  
 1820 Fraser, A. T. F., of Abertarff, Inverness  
 1840 Fraser, Evan Baillie, Balloan Cottage, Inverness  
 1869 Fraser, Fran. G., of Findrack, Torphins  
 1869 Fraser, Colonel Fred. Mackenzie, of Castle Fraser, Aberdeen  
 1873 Fraser, H. Newby, Hay Close, Penrith  
 1853 Fraser, Hugh, Balloch of Culloden, Inverness  
 1856 Fraser, Hugh, 29 Arundell Gardens, Kensington Park, London  
 1874 Fraser, James, C.E., Inverness  
 1874 Fraser, James, Mauld, Beaulieu  
 1840 Fraser, John, London  
 1856 Fraser, John, of Bunchrew, Inverness  
 1865 Fraser, Capt. John, of Balnain, Faraline House, Gorthlick  
 1854 Fraser, Patrick Allan, of Hospitalfield, Arbroath  
 1863 Fraser, Patrick, Sheriff of Renfrew and Bute  
 1839 Fraser, Robert, Brackla, Nairn

Admitted

- 1867 Fraser, Simon, Lerags House, Oban  
 1869 Fraser, Wm., Chemical Manufacturer, Broxburn  
 1850 Fraser, W. S., Banker, Dornoch  
 1852 Fraser, William, of Kilmuir, Skye  
 1861 Fraser, Wm., Greenhill, Dunning  
 1865 Fraser, Wm., Annfield, Inverness  
 1873 Fraser, Wm. A., Brackla, Nairn  
 1859 Frazer, John, Overton, New Abbey, Dumfries  
 1857 Frederick, D., of Gass, Dumbredan, Stranraer  
 1869 Frederick, Robt., Drumflower, Glenluce  
 1868 Freeland, Jas., Broadgate, Strathblane  
 1855 French, James, Sorkjeer, Fredericks-havn, Denmark  
 1870 French, Thomas, Netherton, Abington  
 1867 Frew, Thomas, Gavell House, Kilsyth  
 1854 Friar, Thos., of Grindon Ridge, Northam, Berwick-on-Tweed  
 1875 Frier, Matthew, Kidston Mill, Peebles  
 1873 Fryer, John J., Musiceller, Dumfries  
 1844 Fullarton, G., of Kerelaw, Stevenston  
 1875 Fullarton, M. J. Bowden, 150 Bath Street, Glasgow  
 1857 Fulton, Andrew, 86 George St., Edinburgh  
 1863 Fulton, Wm., Hatchetnize, Coldstream  
 1847 Fyfe, John, of Dalmarnock, Glasgow  
 1861 Fyfe, Robert, junior, Arlary, Kinross  
 1868 Gairdner, Chas., Union Bank, Glasgow  
 1858 Gairdner, Robert, Banker, Kilmarnock  
 1873 Galashan, Chas. C., Saddler, Alloa  
 1857 Galbraith, Alex., Croy Cunningham, Killearn  
 1872 Galbraith, John, Edentaggart, Luss  
 1873 Galbraith, Thos. L., Town Clerk, Stirling  
 1864 Galloch, J., Knockhill, Bridge of Allan  
 1860 GALLOWAY, Right Hon. the Earl of, Galloway House, Garsiestown  
 1874 Galloway, Alex., C.E., Killin  
 1861 Galloway, David Cairnie, Glencarse  
 1859 Gamgee, J., 1 Great Winchester Street Buildings, London, E.C.  
 1859 Garden, Arch., Grangegreen, Forres  
 1874 Garden, Robert, North Ythsie, Tarves  
 1857 Garden, William, Braco Park, Fraserburgh  
 1857 Gardiner, George, Carrington Barns,  
 1869 Gardiner, John, Cockburn, Balerno  
 1864 Gardiner, P., Rottearns, Braco, Perthshire  
 1873 Gardiner, Patrick, Newbigging, Auchterarder  
 1861 Gardiner, R., of Rottearns, Chapelbank, Auchterarder  
 1859 Gardner, James, 58 George St., Edin.

Admitted	Admitted
1870 Gardner, John, 4 Abbotsford Place, Glasgow	1873 Giglioli, Italo. Florence— <i>Free Life Member</i>
1855 Gardner, Robert, Gattonside, Melrose	1865 Gilchrist, Dug., of Opsidale, Dornoch
1855 Gardner, Robt., City of Glasgow Bank, Whitburn	1873 Gilchrist, John, Todhill, Larbert
1873 Gardner, Wm., Kepdownrie, Bucklyvie	1842 Giles, James, Dresden
1867 Gardyne, Col. C. G., of Finhaven, Forfar	1848 Gilkison, Robert, jun., Glasgow
1849 Garland, John, Cairnton, Fordoun	1875 Gill, John, Blingery, Wick
1851 Garland, Thomas, Ardlethen, Ellon	1854 Gillanders, J. F., of Highfield, Beaully
1825 Gartshore, John Murray, of Ravelston, Murrayfield, Edinburgh	1836 Gillespie, Alex., Merchant, London
1864 Gartshore, John, Seedsman, Falkirk	1871 Gillespie, Alex., Kirkton Barns, Ferry-Port-on-Craig
1854 Gatherer, George, Solicitor, Elgin	1841 Gillespie, David, of Mountquhannie, Cupar-Fife
1859 Gaukroger, G., Southfield, Longniddry	1849 Gillespie, James, Craigie, Cramond
1843 Geddes, James, Orbliston, Fochabers	1860 Gillespie, James, Gateside, Douglas
1837 Geekie, Alex., of Baldowrie, Coupar-Angus	1847 Gillespie, John, W.S., Edinburgh
1837 Geekie, Peter, Balboughty, Perth	1873 Gillespie, Rev. John, Mouswald Manse, Dumfries
1861 Geekie, Peter M., Cortachy, Kirriemuir	1875 Gillespie, John, Land Steward, Minard, Inveraray
1871 Geekie, Robert, yr. of Baldowrie, Rosemount, Blairgowrie	1829 Gillespie, Robert, Merchant, London
1872 Geikie, Archibald, Professor of Geology, University of Edinburgh, Burrowfield House, Merchiston	1872 Gillies, Dr Hugh, Easdale, Oban
1844 Geils, J. E., of Dumbuck, Hillhead, Dunkeld	1862 Gillison, Thomas, 3 Dryden Road, Edge Lane, Liverpool
1871 Gemmel, Andrew, Writer, Haddington, Secretary, United East Lothian Agricultural Society	1848 Gillon, Andw., of Wallhouse, Bathgate
1840 Gentle, Robert, Inverness	1875 Gilmour, Alexander, Annfield House, Irvine
1842 Gerard, Archd., of Rochsoles, Airdrie	1849 Gilmour, Allan, of Eaglesham, Glasgow
1873 Gerrard, John, Veterinary Infirmary, Market Deeping— <i>Free Life Member</i>	1873 Gilmour, John, younger of Lundin, Montrave, Kennoway
1871 Gibb, David, Lochty, Pittenweem	1863 Gilmour, John, of Mount Vernon, Row
1834 Gibbon, A., of Johnston, 6 Newbattle Terrace, Edinburgh	1857 Gilmour, Matthew, Town of Inchinnan, Paisley
1869 Gibbons, Thomas, Burnfoot, Longtown	1828 Gilmour, W. J. Little, of Craigmillar
1849 Gibbs, B. T. Brandreth, Half Moon Street, Piccadilly, London	1863 Gilmour, W. M., Glasgow
1871 Gibson, Charles, Pitlochry	1855 Girdwood, Robert, Tanfield, Edinburgh
1871 Gibson, James, 34 Abbotsford Place, Glasgow	1841 Gladstone, R., Merchant, Liverpool
1863 Gibson, James, The Shaws, Selkirk	1834 Gladstone, Sir Thomas, of Fasque, Bart., Laurencekirk
1864 Gibson, J., Gunsgreen Hill, Eyemouth	1853 Gladstone, Thomas Stewart, of Capenoch, Thornhill
1825 Gibson, John, W.S., Edinburgh	1854† Glasgow, Right Hon. the Earl of, Crawford Priory, Cupar-Fife
1828 Gibson, John, jun., W.S., Edinburgh	1847 Glasgow, Alex., of Old Court, Cork
1846 Gibson, John, Woolmet, Dalkeith	1874 Glasgow, R. Bruce Robertson, of Montgreenan, Kilwinning
1853 Gibson, Jn., Eastfield, Wiston, Biggar	1857 Glegg, John, Factor, Milliken House, Johnston
1860 Gibson, J., Tallowquhairn, Kirkbean, Dumfries	1873 Glen, James, Rosebank, Luss
1875 Gibson, Jn., Sangskail, Rousay, Orkney	1872 Glen, James, Stronafyne, Arrochar
1859 Gibson, Robert, Faldonside, Melrose	1847 Glen, John, late Merchant, Edinburgh
1875 Gibson, Robert, Sangskail, Rousay, Orkney	1860 Glen, Robert R., Banker, Linlithgow
1843 Gibson, Thomas, Ferniehurst, Stow	1865 Glen, Robert C., Auchenback, Barrhead
1869 Gibson, Thomas, Bainfield, Fountain Bridge, Edinburgh	1853 Glen, Thomas, Thornhill, Paisley
1859 Gibson, Wm. W., 6 Albyn Place, Edin.	1869 Glendinning, Alexander, Winchburgh
1869 Gibeone, Lieut.-General, of Pentland, Thorn Bank, Leamington	1849 Glendinning, G., Hutton Mains, Ratho
	1873 Glendinning, Geo. P., Dalmeny Park, Edinburgh

Admitted

- 1869 Glendinning, G. R., Hatton Mains, Ratho  
1874 Glendinning, James P., Rawfarm, Mid-Calder  
1848 Glendinning, Peter, Dalmeny Park, Edinburgh  
1854 Glendinning, Robert W., Broomdykes, Chirnside  
1851 Glennie, Arthur, Fernyflat, Bervie  
1859 Glover, And., Lanrick Castle, Stirling  
1873 Goddard, H. R., Belsay, Newcastle-on-Tyne—*Free Life Member*  
1873 Gold, Joseph, Murthly Farm, Perth  
1865 Goldie, R. G. M., 3 Comely Green Place, Edinburgh  
1874 Goodbrand, Jas. H., Culnaha, Nigg, Ross-shire  
1851 Goodlet, William, Bolshan, Arbroath  
1875 Gordon, Adam Hay, of Mayen and Avochie, Huntly  
1875 Gordon, Arthur Newton Forbes, of Rayne, Pitcaple  
1866 Gordon, Chris., Cannerie, Parton  
1835 Gordon, Admiral Charles, Huntly  
1873 Gordon, Carlos Pedro, of Wardhouse, Inch, Aberdeenshire  
1860 Gordon, David A., of Culvennan, Greenlaw House, Castle-Douglas  
1840 Gordon, Right Hon. Edward S., Q.C., M.P., Lord Advocate, 2 Randolph Crescent, Edinburgh  
1860 Gordon, G., Tullochallum, Dufftown  
1873 Gordon, Captain Geo. G., Milntown of Kilravock, Nairn  
1855 Gordon, H. G., late Oriental Bank, London  
1860 Gordon, Henry, Sheriff-Clerk, Dumfries  
1868 Gordon, Henry Wolrige, of Hallhead, Esselmont, Ellon  
1862 Gordon, Captain James Alex., Ittingston, Huntly  
1874 Gordon, James A., Udale, Invergordon  
1838 Gordon, John, of Aikenhead, Cathcart  
1870 Gordon, Jno., Culraven, Kirkcudbright  
1871 Gordon, John, of Craigmyle, Torphins  
1853 Gordon, John, Lettoch, Glenlivet, Balmalloch  
1861 Gordon, John, of Cluny, Aberdeen  
1875 Gordon, John, Balmuchy, Fearn  
1831 Gordon, John Taylor, late of Nethermuir, New Deer  
1846 Gordon, Robert Macartney, of Rattrra, Ellenbank, Kirkcudbright  
1870 Gordon, Robt. Wm., Comlongan Mains, Annan  
1863 Gordon, Thomas Dempster, late of Balmaghie, Castle-Douglas  
1870 Gordon, Thomas, 11 Grovesnor Crescent, Edinburgh

Admitted

- 1847 Gordon, W. Cosmo, of Fyvie, Aberdeen  
1866 Gough, Wm., Land Agent, Wykeham, York  
1871 Goulding, W., North Wall, Dublin  
1871 Gourlay, Robert Conning, Arbrack, Whithorn  
1851 Gow, John L., Raith, Kirkcaldy  
1860 Gowans, James, 16 Randolph Crescent, Edinburgh  
1868 Græme, Robert, of Garvock, Perthshire  
1873 Graham, Alexander, Blackwater, Kilmalcolm  
1862 Graham, Carolus J. Home, 37 Melville Street, Edinburgh  
1817 Graham, George, late of Cassafuar  
1869 Graham, George, Oakbank, Longtown  
1855 Graham, H., Auckland, New Zealand  
1827 Graham, James, Toronto  
1848 Graham, James Maxtone, of Redgerton, Perth  
1851 Graham, James, Parcelstown, Longtown  
1863 Graham, James, Southbar, Paisley  
1864 Graham, James, Myothill, Denny  
1874 Graham, John, 7 Old Smithhills Street, Paisley  
1852 Graham, John, of Shaw, Lockerbie  
1842 Graham, John Murray, of Murrays-hall, Perth  
1865 Graham, Paul, of Drynie, 1 Carlisle Place, Victoria Street, London  
1873 Graham, Robert G., Beanlands Park, Carlisle  
1834 Graham, Col. William, of Mossknowe, Ecclefechan  
1854 Graham, Wm., of Devonshaw, Dollar  
1855 Graham, William, jun., Antfield, Inverness  
1871 Graham, William, Easter Caputh, Dunkeld  
1870 Graham, William B., Unthank, Ewes, Langholm  
1869 Graham, Wm. C., Dunclutha, Dunoon  
1833 Graham, William Stirling, of Airth, Larbert  
1853 Grahame, Barron, of Morphie, Shannahburn, Aberdeen  
1873 Grahame, James, of Auldhouse, Pollockshaws  
1873 Granger, Andrew, Fettes, Inverness  
1861 Granger, John, Pitcur, Coupar-Angus  
1872 GRANT, Sir Alex., Bart., Principal of the Edinburgh University  
1854 GRANT, Sir Archd., of Monymusk, Bart., Aberdeen  
1872 Grant, A., Ardkinglass, Cairndow  
1862 Grant, Charles, Hazelbrae, Glen Urquhart  
1874 Grant, Charles T. C., of Kilgraston, Bridge of Earn

- | Admitted |   | Admitted |   |
|----------|---|----------|---|
| 1868     | Grant, D. R. Lyall, of Kingsford, Aberdeen                            | 1867     | Greenshields, James, Westown, Losmahagow                                  |
| 1858     | Grant, Francis William (Monymusk), 19 Ryder Street, St James', London | 1854     | Gregory, Alex. Ailan, Corn-Merchant, Inverness                            |
| 1869     | Grant, Captain Frederick G. Forsyth, of Ecclesgreig, Montrose         | 1833     | Gregory, Arthur Thomas, late of Buchrumb, Duftown                         |
| 1874     | Grant, George, Pollo, Invergordon                                     | 1871     | Greig, David (John Fowler & Co.), Leeds                                   |
| 1859     | GRANT, Sir George Macpherson, of Ballindalloch, Bart., Ballindalloch  | 1873     | Greig, David, Muircote, Tillicoultry                                      |
| 1828     | Grant, Rev. James, D.C.L., D.D., Chaplain to the Society, Edinburgh   | 1868     | Greig, George, India Buildings, Edinburgh                                 |
| 1865     | GRANT, Lieut.-Col., the Hon. James, of Grant, Invererne, Forres       | 1870     | Greig, J. A., Terreglestown, Dumfries                                     |
| 1859     | Grant, James, late Clashnoir, Duftown                                 | 1873     | Greig, James Booth, Secretary Kincardineshire Farmers' Club, Laurencekirk |
| 1871     | Grant, John, Inverlaidnan, Carr Bridge                                | 1869     | Greig, Peter M., 56 Inverleith Row, Edinburgh                             |
| 1865     | Grant, John, Mains of Pitgaveny, Elgin                                | 1852     | Greig, Thomas, of Glencarse, Porth  |
| 1853     | Grant, Kenneth, Kinellan, Dingwall                                    | 1861     | Greig, T. Watson, Palmerston Place, Edinburgh                             |
| 1862     | GRANT, Lieut.-Gen. Sir Patrick, G.C.B.                                | 1854     | Grey, Geo. A., Millfield Hill, Wooler                                     |
| 1826     | Grant, Robert, of Kincorth, Forres                                    | 1860     | GRIERSON, Sir Alex. William, of Lagg, Bart., Rockhall, Mouswald, Dumfries |
| 1841     | Grant, Robert, of Druminnor, Rhynie                                   | 1851     | Grierson, J., Little Kirkland, Haugh of Urr, Dalbeattie                   |
| 1842     | Grant, Robert, Bookseller, Edinburgh                                  | 1855     | Grierson, James, of Dalgoner, Dunscore                                    |
| 1846     | Grant, Thos. Macpherson, of Craigo                                    | 1860     | Grierson, J., Morton Mains, Thornhill                                     |
| 1874     | Grant, Major William, Drumbuie, Glen Urquhart, Inverness              | 1859     | Grierson, Jos., Breoch, Castle-Douglas                                    |
| 1862     | Grant, William, Drumdelgie, Huntly                                    | 1860     | Grierson, Robt., Westmains, Mouswald, Dumfries                            |
| 1833     | Grant, William, of Elchies, Craigellachie                             | 1859     | Grierson, Wm., Tors, Castle-Douglas                                       |
| 1839     | Grant, William, Australia   | 1872     | Grieve, Archd., Albyrigg, Canonbie  |
| 1874     | Grant, Colonel W. L., Borgia House, Farr, Thurso                      | 1867     | Grieve, D., Blackberry Hill, Whitburn                                     |
| 1829     | Grassick, John, Aberdeen  | 1873     | Grieve, James, Borthwickbrae Burnfoot, Hawick                             |
| 1859     | Gray, Alex., Tanlawhill, Langholm                                     | 1872     | Grieve, Jas., Branzholm Braes, Hawick                                     |
| 1873     | Gray, Andrew, West Plean, Stirling                                    | 1858     | Grieve, John, Castles, Dalnally   |
| 1856     | Gray, Donald, Golspie   | 1869     | Grieve, John, St James' Hall, Regent Street, London                       |
| 1857     | Gray, George, Windyvet, Falkirk                                       | 1859     | Grieve, Michael, Callander  |
| 1858     | Gray, G., Boggriffie, Fintray, Aberdeen                               | 1857     | Grieve, Robert, Auch, Tyndrum   |
| 1873     | Gray, James, Birkenwood, Gargunnoch                                   | 1857     | Grieve, Robert, Ramoyle, Dunblane   |
| 1861     | Gray, J., Brachead Mains, Cramond                                     | 1861     | Grieve, Walter, Glendevon, Dollar   |
| 1868     | Gray, James, Seedsman, Stirling                                       | 1854     | Grieve, William, Skelfhill, Hawick  |
| 1871     | Gray, James, Kirkton of Collaco, Balbeggie, Perth                     | 1858     | Grigor, James D., Wester Alves, Forres                                    |
| 1875     | Gray, James, Blawarthill, Yoker, Glasgow                              | 1847     | Grigor, John, Nurseries, Forres   |
| 1871     | Gray, John, Merchant, Helensburgh                                     | 1871     | Grimmond, Alex. D., of Gleniericht, Blairgowrie                           |
| 1856     | Gray, John, Uddingston, Glasgow                                       | 1872     | Guild, Andrew, The Rhodes, Alva   |
| 1854     | Gray, Patrick, Middle Strath, Falkirk                                 | 1868     | Guild, James, Balgone Barns, North Berwick                                |
| 1854     | Gray, Thomas, Coul, Markinch  | 1874     | Guild, James Lyon, Abbey, North Berwick                                   |
| 1858     | Gray, Thomas R., of King's Grange, Dalbeattie                         | 1868     | Guild, James Wyllie, C.A., Glasgow  |
| 1849     | Gray, Wm., Southfield, Duddingston, Edinburgh                         | 1856     | Gulston, Alan Jas., of Dirleton, Llan-gadock, Carmarthenshire             |
| 1855     | Gray, William, Brownrigg, North Berwick                               | 1850     | Gunn, Alex., Dale, Halkirk, Golspie                                       |
| 1874     | Green, Robert, Ruthrie, Aberlour, Craigellachie                       | 1856     | Gunn, Alexander, Dornoch  |
| 1857     | Green, William, Lynnburn, Aberlour, Craigellachie                     | 1839     | Gunn, James, Sibster, Wick  |
| 1873     | Greenlees, Alex., Summerhill, Camp-town                               |          |   |

Admitted

- 1868 Gunn, John, Glendhu, Lairg  
 1849 Gunn, Marcus, Culgower, Golspie  
 1875 Gunn, Wm., Factor for Her Grace the  
 Duchess of Sutherland, Strathpeffer  
 1874 Gunniss, Geo. Ponton, Leckie House,  
 Stirling  
 1854 Guthrie, David, Banker, Stranraer  
 1836 Guthrie, John, of Guthrie, Forfar  
 1857 Guthrie, Robert, Crossburn, Troon  
 1874 Gwyer, Cecil F., Biallid, Kingussie  
 1834 Gwynne, Alban Thomas Jones, of Mon-  
 achty, Cardigan  
 1857+HADDINGTON, Right Hon. the Earl of,  
 Tynningham, Prestonkirk  
 1857 Haddon, Andrew, Honeyburn, Hawick  
 1854 Hadwen, S., Kildonan Lodge, Golspie  
 1862 Hagart, Colonel, The Cleave, Torquay  
 1869 Hagart, James Valentine, W.S., 140  
 Princes Street, Edinburgh  
 1871 Haggart, Peter, Keltneyburn, Aber-  
 feldy  
 1874 Haig, Archd. R., Quarryford, Gifford  
 1869 Haig, Hugh V., Cameron House,  
 Windygates  
 1841 Haig, J., Cameron House, Windy-  
 gates  
 1874 Haig, James Richard, of Blairhill,  
 Dollar  
 1869 Haig, W. H., Cameron House, Windy-  
 gates  
 1857 Haig, William (late North Street, St  
 Andrews), Australia  
 1861 Hain, David, Balgove, St Andrews  
 1871 Hain, Thomas, Balmullo, Leuchars  
 1859 Haldane, Robert, Fernielee, Gala-  
 shiels  
 1870 Halkett, David H., Banker, Alyth  
 1864 Halkett, Jas., Auchentender, Insch  
 1864 Halkett, Lieut-Col. John Craigie, yr.  
 of Cramond, Edinburgh  
 1861 Hall, Alex., Rhynd, Leuchars, Fife  
 1873 Hall, Allan, Deiquick, Ardmaddy,  
 Easdale  
 1855 Hall, Andrew, of Calrossie, Blairrich  
 Cottage, Rogart, Golspie  
 1872 Hall, Geo., late Downham, Coldstream  
 1874 Hall, George Ross, Invergordon  
 1846 Hall, Henry, Coul, Dornoch  
 1849 HALL, Sir James, of Dunglass, Bart.,  
 Cockburnspath  
 1868 Hall, James, 33 Frederick Street,  
 Aberdeen  
 1874 Hall, John, Tomich, Invergordon  
 1867 Hallen, J. H. B., M.R.C.S.E., Staff-  
 Vet. Surgeon, H.M. Bombay Army  
 1844 HALLIBURTON, Right Hon. Lord John,  
 Halliburton House, Coupar-Angus  
 1865 Halliday, Thomas, Rosehall Foundry,  
 Haddington

Admitted

- 1860 Halley, A., Millhole Mill, The Cairnies,  
 Perth  
 1868 Halley, George, New Mills, Culhoss  
 1870 Halley, John, Dornoch Mills, Crieff  
 1865+HAMILTON & BRANDON, His Grace the  
 Duke of  
 1874 Hamilton, Alex., of Rozelle, Ayr, Com-  
 mander R.N.  
 1868 Hamilton, Claud Hamilton, Preston  
 Hall, Dalkeith  
 1861 Hamilton, Daniel, 66, Hutchison St.,  
 Glasgow  
 1869 Hamilton, George, Ardendee, Kirkcud-  
 bright  
 1853 Hamilton, Hugh, of Pinmore, Girvan  
 1865 Hamilton, James, Wallace Bank, Kil-  
 marnock  
 1869 Hamilton, J. B. B. Baillie, of Arnprior,  
 Cambusmore, Callander  
 1869 Hamilton, James, Woolfords, Carn-  
 wath  
 1870 Hamilton, John, Conenish, Tyndrum  
 1839 Hamilton, John, of Sundrum, Coylton  
 1846 Hamilton, John, of Greenbank, Newton  
 Mearns  
 1872 Hamilton, John, Banker, Lesmahagow  
 1860 Hamilton, John, Longrig, Torthorwald  
 1864 Hamilton, J., Monktonhill, Monkton,  
 Ayr  
 1846 Hamilton, John Buchanan, of Leny,  
 Callander  
 1857 Hamilton, John G. Carter, of Dalzell,  
 Motherwell  
 1858 Hamilton, John G., Hafton House,  
 Dunoon  
 1855 Hamilton, J. B. (late Burnhouse, Carn-  
 wath), London  
 1870 HAMILTON, The Hon. R. B., M.P.,  
 Langton, Dunse  
 1825+HAMILTON, Right Hon. R. C. Nisbet,  
 Biel House, Prestonkirk  
 1871 Hamilton, Robt., Denmarkfield, Red-  
 gorton  
 1873 Hamilton, Robert, 30 St Andrew  
 Square, Edinburgh  
 1871 Hamilton, William, Denmarkfield, Red-  
 gorton  
 1823 Hamilton, Wm., Merchant, Glasgow  
 1864 Hamilton, Wm., of Cairns, Mid-Caldar  
 1852 Hamilton, W. C., of Craighlaw,  
 Wigtown  
 1874 Hamilton, William Cameron, Balta  
 Sound, Unst  
 1859 Hamilton, Wm. F., Callendar Park,  
 Falkirk  
 1864 Hamilton, Rev. Z. M., D.D., Bressay,  
 Lerwick  
 1872 Handyside, J. B., Ferniehurst, Jedburgh  
 1875 Handyside, Thomas, The Glen, Mus-  
 selburgh

*Admitted*

- 1843 Handyside, W., of Cornhill, 11 Claremont Crescent, Edinburgh  
 1861 Hanning, John, Boghead, Mouswald, Dumfries  
 1854 Hannan, J., The Terrace, Pocklington, Yorkshire  
 1872 Hannan, J. D., Dunse Castle, Dunse  
 1858 Hannay, John, Gavenwood, Banff  
 1870 Hanning, J. J., Skipmyre, Lochmaben  
 1871 Hardie, Chas., Primrose, Dunfermline  
 1870 Hardie, David, Priestthaugh, Hawick  
 1851 Hardie, George, Australia  
 1861 Hardie, Robert, Harrietfield, Kelso  
 1863 Hardie, W. H., Bo' Mains, Linlithgow  
 1849 Hare, Stuart Bayley, of Calderhall, Mid-Calder  
 1873 Harley, D., Rosebank, Bonnington Road, Edinburgh  
 1853 Harper, Frank, Torgorm, Dingwall  
 1867 Harper, Joseph, Snawdon, Gifford  
 1871 Harper, William, Drum Bank, Liberton  
 1864 Harris, Richard H., Earnhill, Forres  
 1871 Harris, William, Cranley, Meikleour  
 1867 Harris, William, Tirinie, Aberfeldy  
 1864 Harrison, George, 17 Whitehouse Terrace, Edinburgh  
 1846 Harrop, I. Worthington, New Zealand  
 1869 Hart, J. Christine, Borrostone, Kin-cardine O'Neil  
 1873 Hart, William, Kirklands, Auchterarder  
 1846 Harvey, C. W., Watton-on-the-Hill, Liverpool  
 1850 Harvey, George, Whittingham Mains, Prestonkirk  
 1854 Harvey, J. H., Pitgersie, Foveran, Ellon  
 1809 Harvey, J., of Tiningly Park, Yorkshire  
 1852 Harvie, Rev. W., of Brownlee, Carluke  
 1860 Hathorn, John Fletcher, of Castliewigg, Whithorn  
 1873 Hawley, William, 27 Frederick Street, Edinburgh  
 1875 Haughton, Wm. Haughton, Factor, Coodham, Kilmarnock  
 1864 Hay, Alexander, Trochelhill, Fochabers  
 1870 Hay, Alexander, Easter Culmalundie, Perth  
 1874 Hay, Alexr. Penrose, Riverdale, Inverness  
 1862 Hay, Col. A. S. Leith, of Rannes, C.B., Leith Hall, Kennethmont  
 1865 Hay, C., Ardbeg Distillery, Port-Ellen, Greenock  
 1862 Hay, Colonel Drummond, of Seggieden, Perth  
 1841 Hay, Geo. W. (of Whiterigg), Sudbury  
 1862 Hay, Captain J. G., of Belton, Dunbar  
 1862 Hay, James, Scrabster, Thurso  
 1828 Hay, James, Merchant, Leith

*Admitted*

- 1858 Hay, James, jun., Little Ythsie, Tarves  
 1855 Hay, J., Nether Mill, Tarves  
 1848 HAY, Sir John C. Dalrymple, of Park Place, Bart., M.P., Glenluce  
 1867 HAY, Sir Robert, of Haystoun, Bart., Kingsmeadows, Peebles  
 1846 Hay, Samuel, 13 Grosvenor Crescent, Edinburgh  
 1819 Hay, William, of Dunse Castle, Dunse  
 1869 Hay, William, 17 Hill Street, Edinburgh  
 1872 Hazle, Alexr., yr. of Blackcraig, Drum-burle House, Maybole  
 1857 Hebden, Robt. J., of Eday, Kirkwall  
 1871 Heggie, Henry, Mains of Beath, Cross-gates  
 1871 Heggie, Robt. B., of West End House, Kirkcaldy  
 1871 Heiton, Andrew, of Darnick Tower, Perth  
 1869 Henderson, Adam, Grange, Dunfermline  
 1837 Henderson, Alexander, Longniddry  
 1847 Henderson, Alex., of Stemster, Thurso  
 1873 Henderson, A. W., Airthrey Paper Mills, Bridge of Allan  
 1874 Henderson, A. W., yr. of Bilbster, Wick  
 1847 Henderson, Charles J., 39 Royal Ter., Edinburgh  
 1854 Henderson, David, of Abbotrue, Bonchester Bridge  
 1860 Henderson, George, Garroch, Dumfries  
 1839 Henderson, James, of Bilbster, Wick  
 1863 Henderson, Jas., Mintokains, Hawick  
 1860 Henderson, Jas., Kelloside, Sanquhar  
 1839 Henderson, J., W.S., Banker, Thurso  
 1850 Henderson, John, Byres, Haddington  
 1859 Henderson, John, Humble Mains, Blackshiels  
 1874 Henderson, Richard, Coldstream—*Free Life Member*  
 1858 Henderson, Robt., late Lawrencehill, Alloa  
 1854 Henderson, Thomas, Pogbie House, Upper Keith  
 1861 Henderson, W., Milton, Coupar-Angus  
 1868 Henderson, William, Redbog, Mintlaw  
 1862 Hendrie, John, Scotsstoun House, Partick  
 1865 Hendrie, J., Castle Heather, Inverness  
 1871 Hendry, John, Cluniefield, Newburgh  
 1874 Henry, John, S.S.C., 29 Rutland Square  
 1863 Hepburn, J., Preston Mains, Prestonkirk  
 1837 HEPBURN, Sir Thos. Buchan, of Smeaton, Bart., Prestonkirk  
 1851 Heriot, F. L. Maitland, of Ramornie, Ladybank, Sheriff of Forfar  
 1830 HERRIES, Right Hon. Lord, Everingham Park, York



Admitted

- 1853 Herries, Alex. Young, of Spottes, 16 Heriot Row, Edinburgh  
 1857 Hewat, Richard, Writer, Castle-Douglas  
 1862 Hewetson, J., Auchembainzie, Thornhill  
 1870 Hewetson, Joseph, Balterson, Newton-Stewart  
 1870 Hiddleston, John, Braehead, Dalswinton, Dumfries  
 1863 Higgins, Robert, Ninewar, Prestonkirk  
 1868 Highet, Robert, Merchant, Garliestown  
 1861 Hill, Alex., of Stonywynd, Boarhills, St Andrews  
 1873 Hill, Arthur James, Accountant, Moor-gate St., London—*Free Life Member*  
 1823 Hill, George Gosset, Merchant, London  
 1847 Hill, James Lawson, W.S., Edinburgh  
 1861 Hill, James, Bradestone, Meikle  
 1850 Hill, John, Carlowrie, Cramond Bridge  
 1868 Hill, John, Whitehill, Lasswade  
 1838 Hill, Lawrence, Writer, Glasgow  
 1861 Hill, Robert, Navidale Ho., Helmsdale  
 1874 Hill, Robert Robertson, Navidale House, Helmsdale  
 1863 Hilson, George, jun., Solicitor, Jedburgh  
 1860 Hilton, Henry, of Fairgirth, Dalbeattie  
 1875 Hindmarsh, Charles, Cambo, New-castle-on-Tyne  
 1869 Hislop, John, Goatfield, Haddington  
 1864 Hislop, Robert, jun., Prestonpans  
 1862 Hobkirk, James, Broadhaugh, Hawick  
 1860 Hog, Thomas A., of Newliston, Kirkliston  
 1842 Hogarth, George, Banker, Cupar-Fife  
 1863 Hogarth, George, Eccles Tofts, Greenlaw  
 1873 Hogarth, Robert, Heiton Mills, Kelso  
 1868 Hogg, Henry, Symington Mains, Stow  
 1860 Hogg, Robert, Rosemay, Penicuik  
 1864 Hogg, Thomas, Hillhouse, Coldstream  
 1875 Holm, John, Japston, Neilston  
 1873 Holliday, Jonathan, Pelutho, West-house, Abbey Town, Cumberland  
 1874 Holst, Christian, Chamberlain to His Majesty Oscar II., and Norwegian Court Paymaster—*Honorary Associate*  
 1843+HOME, Right Hon. the Earl of, The Hirsell, Coldstream  
 1866 Home, David Milne, of Wedderburn, Paxton House, Berwick  
 1874 Home, David Milne, yr. of Wedderburn, M.P., Capt. Royal Horse Guards  
 1829 Home, Francis, Bellsyde, Linlithgow  
 1881 Home, G. H. M. Binning, of Argaty, Doune  
 1857 Honeyman, John, Laughton Lodge, Hawkhurst, Sussex

Admitted

- 1858 Hood, Archibald, Rosewell, Lasswade  
 1857 Hood, James (late Newmains, Prestonkirk), Australia  
 1827 Hood, John, of Stoneridge, Coldstream  
 1859 Hood, John, Townhead, Cockburnspath  
 1861 Hood, John, Linross, Kirriemuir  
 1854 Hood, T., Coldstream Mains, Coldstream  
 1869 Hope, Alex. P., Bordlands, Lamancha  
 1851 Hope, Andrew (late Edinburgh), Ireland  
 1832 HOPE, Sir Archibald, of Pinkie, Bart., Musselburgh  
 1848 Hope, Geo., of Bordlands, Lamancha  
 1865 Hope, Henry W., of Luffness, Drem  
 1868 HOPE, Admiral Sir James, of Carriden, G.C.B., Bo'ness  
 1847 Hope, James, Duddingston, Edinburgh  
 1872 Hope, James L. A., Hopetoun House, South Queensferry  
 1848 Hope, J., of Belmont, W.S., Edinburgh  
 1859 Hope, Wm., North British Agricultural Co., Leith  
 1871 Horn, John, of Thomanean, Milnathort  
 1851 Horn, Robert, Advocate, Edinburgh  
 1864 Horncastle, Henry, Whitemoor, Oller-ton, Newark  
 1851 Horne, T. E. Ogilvy, W.S., Edinburgh  
 1858 Hornsby, Richard, Spittlegate Iron Works, Grantham  
 1841 Horsburgh, R., of Southbank, Penicuik  
 1853 Hosack, William, Barcaldine, Taynuilt  
 1865 Hosack, John, Dochcarty, Dingwall  
 1865 Houldsworth, Henry, jun., Glasgow  
 1868 Houldsworth, J., of Coltness, Motherwell  
 1865 Houldsworth, J. M., Carrick House, Ayr  
 1857 Houldsworth, Joseph Henry, Glasgow  
 1865 Houldsworth, T., of Farnsfield, Notts  
 1872 Houldsworth, Walter J., Coltness House, Wishaw  
 1857 Houldsworth, William, Glasgow  
 1875 Houstoun, George L., of Johnstone, Johnstone, Renfrewshire  
 1873 Houstoun, Robert A., Clerkington, Haddington  
 1854 Houstoun, Wm., Kintradwell, Golspie  
 1859 Howard James (J. & F. Howard), Bedford  
 1865 Howatson, Charles, of Dornel, Dal-dorch House, Mauchline  
 1875 Howatzen, John L., Becks, Langholm  
 1865 Howden, John, late Seedsman, Inverness  
 1864 Howden, John, Overseer, Nether Braco, Perthshire  
 1850 Howden, Robert, Boggs, Pencaitland  
 1854 Howe, Alexander, W.S., Edinburgh  
 1863 Howie, H. Brown, Kylloe Cottage, Beal

## Admitted

- 1863 Howie, James, Haddon, Kelso  
 1857 Howie, John, Hurlford, Kilmarnock  
 1855 Hoyle, Duncan, London  
 1822 Hozier, J., of Mauldslee Castle, Carlisle  
 1862 Hozier, W. W., of Tannochside, Bells-hill  
 1853 Hubbach, Joseph, Liverpool  
 1865 Hudspith, Wm., Brookside, Haltwhistle  
 1844 Huggins, W. B., Glasgow  
 1860 Hughan, Peter, Culter, Garliestown  
 1838 Hughan, Thomas, of Airds  
 1872 Hughes, Geo. P., of Middleton Hall, Wooler  
 1875 Hugonin, R., Kinmyle House, Inverness  
 1857 Huie, James, Derry, Campbeltown  
 1869 Hume, Archibald, of Auchendolly, Dalbeattie  
 1871 Hume, George T., Sunlawhill, Kelso  
 1869 Hume, John, East Balmirmer, Arbroath  
 1818 Hume, M. N. Macdonald, W.S., Edinburgh  
 1840 Hume, P. Halyburton, Lawfield, Cockburnspath  
 1859 Hunt, James Alex., of Pittencreeff, Logie, Dunfermline  
 1855 Hunter, Alex., Nethershiel, Ratho  
 1826 Hunter, David, of Blackness, Dundee  
 1867 Hunter, David, Guiltreehill, Maybole  
 1860 Hunter, Evan Alan, W.S., Edinburgh  
 1861 Hunter, Herbt., of Burnhead, Lock-erbie  
 1867 Hunter, James, Coplawhill, Strathbungo, Glasgow  
 1852 Hunter, James, of Glenapp, Newmains House, Newmains  
 1873 Hunter, James (of Pilloor, Neilgherry Hills, Madras), 18 Belgrave Crescent, Edinburgh  
 1842 Hunter, J. Wm., of Thurston, Dunbar  
 1864 Hunter, John, Dipple, Fochabers  
 1871 Hunter, Patrick, Argaith, Perth.  
 1837 Hunter, Richard, 10 Ainslie Place, Edinburgh  
 1867 Hunter, Robert A., Lephinstreath, Campbeltown  
 1862 Hunter, Robt., 10 Ainslie Place, Edinburgh  
 1871 Hunter, Robert, Moncur, Inchtute  
 1869 Hunter, William, Craighead, Abington  
 1870 Hunter, William, Crawfordton Lodge, Moniaive  
 1853 Hunter, William B., Haugh, Kirkliston  
 1857 Hunter, William, Machribeg, Campbeltown  
 1850 Huntley, R. Hodgson, of Carham Hall, Coldstream  
 1872 HUNTLEY, Most Noble the Marquis of, Aboyne Castle, Aboyne

## Admitted

- 1859 Husband, Robert, Gellat, Dunfermline  
 1838 Hutchinson, Jas., Merchant, Glasgow  
 1857 Hutchison, James, Mouswald Farm, Dumfries  
 1872 Hutchison, Jas. Thos., 28 Royal Terrace, Edinburgh  
 1872 Hutchison, J. H., Manor House, Catterick  
 1871 Hutchison, Robt., Merchiston Avenue, Edinburgh  
 1829 Hutchison, R., of Cairngall, Longside  
 1850 Hutchison, Robt., Braehead, Kirkcaldy  
 1858 Hutchison, R., of Carlowrie, Kirkliston  
 1870 Hutchison, Thos., Greenend, Liberton  
 1868 Hutton, Arthur, Comlongan Castle, Annan  
 1859 Hyndman, Henry C., of Springside, West Kilbride  
 1870 Hyslop, And., Auchencroch, Kirkpatrick-Durham, Dalbeattie,  
 1857 Hyslop, H. D. B., Tower, Sanquhar  
 1870 Hyslop, John, of Bank, New Cumnock  
 1873 Imrie, Jn., Blackhill, Maryhill, Glasgow  
 1869 Inch, James G., Mitchellhill, Biggar  
 1855 Inch, John, West Mains, Liberton  
 1870 Inch, Thos., Gilmerscleuch, Abington  
 1869 Inglis, Alex. Wood, yr. of Glencorse, Edinburgh  
 1834 Inglis, Charles Craigie Halkett, of Cramond  
 1874 Inglis, David, Flemington, Lerwick  
 1864 Inglis, George, Dron, Cupar Fife  
 1847 Inglis, Harry Maxwell, of Loganbank, P.C.S., Edinburgh  
 1849 Inglis, Henry, of Torsence, W.S., Edinburgh  
 1856 Inglis, Lieut.-Col. Hugh, of Kingsmills, Inverness  
 1852 INGLIS, Right Hon. John, of Glencorse, Lord Justice-General  
 1860 Inglis, John, Steam Mills, Musselburgh  
 1857 Inglis, John, of Redhall, Sleaford  
 1864 Inglis, John, Kepdarroch, Gargunnoch  
 1865 Inglis, Peter, East Pilton, Ferry Road, Edinburgh  
 1872 Inglis, Wm., Prendergast, Ayton  
 1870 Ingram, Alex., Challock, Stranraer  
 1857 Inkson, Patrick, Berryleys, Keith  
 1840 Innes, Alex., of Raemuir, Banchory  
 1842 Innes, Alexander Mitchell, of Ayton  
 1874 Innes, Charles, Solicitor, Inverness  
 1865 Innes, Frederick S. Bentley, of Thrumster, Golspie  
 1865 Innes, William Mitchell, yr. of Ayton  
 1847 Innes, George Mitchell, of Bangour, Edinburgh  
 1838 INNES, Sir J. Milne, of Edingight, Bart., Keith  
 1847 Innes, John B., W.S., Edinburgh

Admitted

- 1846 Innes, Col. Thomas, of Learney, Torphins  
 1842 Innes, Thos. S. Mitchell, of Phantassie, Prestonkirk  
 1862 Innes, T. G. Rose, of Netherdale, Turriff  
 1858 Ironside, John, Brindy, Keig, Whitehouse, Aberdeen  
 1859 Ironside, William, Clofrickford, Ellon  
 1845 Irvine, Alex. Forbes, of Drum, Sheriff of Argyll, 25 Castle Terrace, Edinburgh  
 1873 Irvine, George Forbes, Nigg, Ross-shire  
 1869 Irvine, Walter, Grangemuir, Pittenweem  
 1843 Irvine, Wm. Stewart, M.D., Craigatin, Pitlochry  
 1870 Irving, Benj., Barndennoch, Auldgirth, Dumfries  
 1870 Irving, Chris., Blackearn, Castle Douglas  
 1870 Irving, John, Boreland, Dunscore, Dumfries  
 1838 Irving, John, London  
 1869 Irving, J. Bell, of Whitehill, Lockerbie  
 1872 Irving, Sam., Carco, Kirkconnel, Sanquhar  
 1871 Jack, Alexander, Agricultural Implement Maker, Maybole  
 1872 Jack, Gavin, Foulden Newton, Berwick  
 1864 Jack, John S., Cambusdrennie, Stirling  
 1863 Jack, M., Peggy's Mill, Cramond Bridge  
 1860 Jack, Samuel, Mersington, Coldstream  
 1855 Jack, Robert, Banker, Motherwell  
 1869 Jack, Thos., Riccarton Mains, Currie  
 1863 Jackson, Edward J. (of the Priory, St Andrews), 6 Coates Crescent, Edinburgh  
 1859 Jackson, John, of Amisfield, Dumfries  
 1870 Jackson, John, Bush, Ewes, Langholm  
 1871 Jackson, William, St Margaret Street, Dunfermline  
 1852 Jameson, Melville, Solicitor, Perth  
 1869 Jamieson, Alexander, C.A., Edinburgh  
 1858 Jamieson, David, Auchmithie Mains, Arbroath  
 1860 Jamieson, George Auldjo, C.A., Edinburgh  
 1874 Jamieson, James Auldjo, W.S., Edinburgh  
 1857 Jamieson, James Fife, Glasgow  
 1860 Jamieson, Jn., of Kingask, St Andrews  
 1865 Jamieson, Michael J., of Arngomery, Kippon, Stirling  
 1874 Jamieson, Robert J., S.S.C., Borrowstounness

Admitted

- 1871 Jamieson, Thomas, High Curchie, Drumore, Stranraer  
 1858 Jamieson, Wm. H., Mayshade, Loanhead  
 1850 JARDINE, Sir Alexander, of Applegarth, Bart., Jardine Hall, Lockerbie  
 1846 Jardine, Andrew, of Lanrick, Stirling  
 1873 Jardine, Andrew, Ballemenoch, Row  
 1846 Jardine, James, of Larriston, Dryfeholm, Lockerbie  
 1854 Jardine, John, of Thorlieshope, Arkleton, Langholm  
 1863 Jardine, Robert, of Castlemilk, Lockerbie  
 1870 Jefferson, Robt., Preston Hows, Whitehaven  
 1869 Jeffrey, David, 14 Randolph Crescent, Edinburgh  
 1857 Jeffrey, John, late Buchanan Street, Glasgow  
 1859 Jeffrey, John, of Balsoney, Kirkcaldy  
 1873 Jenkinson, A., 10 Princes Street, Edinburgh  
 1872 Jerdan, William, Kelso  
 1831 JERVISWOODE, Hon. Lord, 10 Strathearn Road, Edinburgh  
 1855 Jobson, William, Buteland, Bellingham, Northumberland  
 1872 Johnson, W. H., Ramrig, Ladykirk, Berwickshire  
 1836 Johnston, Alexander, W.S., Johnston, Rubislaw, Aberdeen  
 1852 Johnston, Alexander, Hailes, Slateford  
 1872 Johnston, Donald, Kilbride, Oban  
 1857 Johnston, G., M.D., Fincaigs, Newport  
 1853 Johnston, George, Marlefield, Kelso  
 1872 Johnston, George, Overtown, Auchnagatt  
 1860 Johnston, James, Banker, Dumfries  
 1873 Johnston, James, Greenburn, Gartincaber, Stirling  
 1857 Johnston, James, Huntington, Lauder  
 1871 Johnston, James, Cattle Dealer, Perth  
 1856 Johnston, John, Banker, Bathgate  
 1853 Johnston, J. S., Craillinghall, Jedburgh  
 1839 Johnston, Robert, Beechwood, Laurencekirk  
 1860 Johnston, Lieut.-Gen., of Carnalloch Castle-Douglas  
 1871 Johnston, Stewart J., Cattle Dealer, Perth  
 1859 Johnston, Thomas, Lochhouse, Moffat  
 1848 JOHNSTON, Sir William, of Kirkhill, Gorebridge  
 1852 Johnston, William, Writer, Bathgate  
 1857 Johnston Wm., Ranachan, Campbelltown  
 1850 Johnstone, Christopher, Dinwoodie Lodge, Lockerbie

## Admitted

- 1842 JOHNSTONE, Hon. Henry Butler, of Corehead, Auchan Castle, Moffat  
 1828 Johnstone, James, of Alva, Stirling  
 1854 Johnstone, Jas., of Bodesbeck, Capple-gill, Moffat  
 1873 Johnstone, James, Hunterheck, Moffat  
 1878 Johnstone, John, of Halleaths, Lockerbie  
 1869 Johnstone, John, Kingledoors, Biggar  
 1875 Johnstone, John, Auchcairn, Laurencekirk  
 1859 Johnstone, John A., Archbank, Moffat  
 1824 Johnstone, J. Jas. Hope, of Annandale, Raehills, Lockerbie  
 1870 Johnstone, John Jas. Hope, yr. of Annandale, M.P.  
 1859 JOHNSTONE, Admiral Sir Wm. J. Hope, K.C.B., Edinburgh  
 1865 Johnstone, Miss Hope, of Annandale, Marchbank Wood, Moffat  
 1859 Johnstone, Robert, Polmoodie, Moffat  
 1859 Johnstone, Walter, Alton, Moffat  
 1874 Johnstone, W. M., National Bank of Scotland, Cupar-Fife  
 1829 Jolly, David Leitch, Banker, Perth  
 1862 Jones, Charles Digby, Kilchamaig, Whitehouse, Kintyre  
 1858 Jopp, Robert, New Zealand  
 1865 Joss, Alexander, Cruchie, Huntly  
 1865 Joss, John, Budgate, Cawdor, Nairn  
 1873 Jukes, R. F., Cotwall, Wellington, Salop—*Free Life Member*  
 1858 Kay, Charles, Glenburgie, Forres  
 1871 Kay, Duncan James, of Drumpark, Dumfries  
 1864 Kay, James, Hillhead, Gargunnoch  
 1863 Kay, John, Softlaw, Kelso  
 1872 Kay, John, jun., Softlaw, Kelso  
 1867 Kay, Robert, Tuns, Minard, Inveraray  
 1871 Kay, Robert, Linton Bankhead, Kelso  
 1863 Kay, Wm., Broomie Knowe, Lasswade  
 1873 Kay, William, Little Kerse, Kippen, Stirling  
 1844 Kaye, Robert, of Millbrae, Moodiesburn  
 1844 Keir, Andrew T., Swinhoe, Chathill  
 1864 Keir, Duncan, Bucklyvie, Stirling  
 1837 Keir, Patrick Small, of Kindrogan, Pitlochry  
 1857 Keir, Simon, Conservative Club, London  
 1859 Keir, William, of Whithaugh, New-castleton  
 1867 Keir, William A., yr. of Kindrogan, Pitlochry  
 1865 Keith, Peter, Factor, Barogill Castle, Wick  
 1873 KELLIE, Right Hon. the Earl of, Alloa Park, Alloa  
 1872 Kellie, John B., Ladywell, Dunse

## Admitted

- 1874 Kelman, William, Balnagore, Fearn, Ross-shire  
 1852 Kemp, Jn., Agricultural Implement Maker, Stirling  
 1863 Kennedy, David, Newlands, Dumfries  
 1866 Kennedy, Duncan C., of Glenstriven, Innellan  
 1865 Kennedy, Henry H., Newlands, Somerset Road, Wimbledon, S.W.  
 1859 Kennedy, Jas., of Sundaywell, Brandleys, Sanquhar  
 1874 Kennedy, John, Forester, Balmacaan, Glen Urquhart  
 1871 Kennedy, John, Royal George Hotel, Perth  
 1846 Kennedy, John Lawson, of Knocknaling, Dalry  
 1870 Kennedy, Robert, of Dalmakerran, Tynron, Thornhill  
 1861 Kennedy, Robert, Ballechin, Ballinluig  
 1812 KENNEDY, Rt. Hon. T. F., of Dunure, Ayr  
 1872 Kennedy, Thos., Coachbuilder, Kelso  
 1842 Kennedy, Wm., Commission Agent, Glasgow  
 1862 Kennedy, William, W.S., Edinburgh  
 1870 Kennedy, William, Kirkland, Sanquhar  
 1874 Kennedy, William, Sherramore, Kin-  
 1874 Kennedy, W. Wemyss, 45 George Street, Edinburgh  
 1860 Kennoway, Robt., Burnhead, Lasswade  
 1863 Ker, E. Martin (late of Gateshaw, Morebattle, Kelso), London  
 1854 Ker, Robt., of Achinraith, Hamilton  
 1864 Kerr, Abram, Castlehill, Durrisdeer, Thornhill  
 1869 Kerr, James, Lochend, Kilbirnie  
 1853 Kerr, John, Land-Surveyor, Dunso  
 1859 Kerr, John, The Bloom, Mid-Caldor  
 1860 Kerr, John, Brocklehurst, Mouswald, Dumfries  
 1875 Kerr, John, Kinnoull, Perth  
 1870 Kerr, Jos., Flatts of Cargen, Dumfries  
 1857 Kerr, Robt., of Chapelodan, Edin.  
 1860 Kerr, Thomas, Whitehill, Sanquhar  
 1845 Kerr, William Williamson, late Oriel College, Oxford  
 1833 Kerr, W. S., of Chatto, Sunlaws, Kelso  
 1865 Kidd, Alexander F., Cledmans House, Airdrie  
 1874 Kidd, Hugh, V.S., Inverness  
 1858 Kidd, J., Balmirmer, Carnoustie  
 1858 Kidd, John, Midscryne, Carnoustie  
 1869 Kidd, Walter, Ballanay, Balerno  
 1844 Kidston, Archibald G., Glasgow  
 1850 Kidston, Jn. P., of Cairns, Cambuslang  
 1864 Kier, Thomas, Newlands, Falkirk  
 1826 Kilgour, Robert, jun., late Millbank, Aberdeen

Admitted

- 1862 Kilpatrick, P., Stancliffe, Matlock, Bath  
 1868 King, Charles M., Antermony House, Milton of Campsie  
 1864 King, David, Roseneath  
 1873 King, Duncan, Kildean, Stirling  
 1857 King, James, yr. of Campsie, 12 Claremont Terrace, Glasgow  
 1872 King, James, West Mills, Colinton  
 1850 King, Jas. F., 5 Richmond St., Glasgow  
 1857 King, John, Braco, Airdrie  
 1871 King, J. Falconar, Analytical Chemist, 18 Brown Square, Edinburgh  
 1869 King, Robert, Levernhelm, Hurlet  
 1873 King, William, jun., Earn, Doune  
 1839 King, Wm., Manufacturer, Glasgow  
 1868 King, Lieut.-Colonel Wm. Ross, of Tertowie, Kinellar, Aberdeen  
 1859 Kininmonth, Peter, Milton, Leuchars  
 1859 Kinloch, Alexander, yr. of Gilmerton, Drem  
 1841 Kinloch, Alex. John, of Park, Aberdeen  
 1828 KINLOCH, Sir David, of Gilmerton, Bart., Drem  
 1825 KINLOCH, Sir George, of Kinloch, Bart., 32 Drummond Place, Edinburgh  
 1829 Kinloch, Col. John Grant, of Kilrie, Logie, Kirriemuir  
 1830+ KINNAIRD, Right. Hon. Lord, K T., Rossie Priory, Inchtute  
 1862 Kinnaird, Hon. Arthur, M.P., 1 Pall Mall, East, London  
 1873 Kinnear, Arthur W., Stonehaven  
 1853 KINNOUL, Right Hon. the Earl of, Dupplin Castle, Perth  
 1873 Kinross, Andrew, Whiteston, Dunblane  
 1864 Kinross, J., Gannochan, Braco, Perthshire  
 1850+ KINTORE, Right Hon. the Earl of, Keith Hall, Inverurie  
 1871 Kinross, Thomas, Loig, Braco, Perthshire  
 1848 Kirk, John, W.S., Edinburgh  
 1861 Kirk, James, Kaimknow, Muckhart  
 1874 Kirkland, Major-General John Agmondisham Vesey (of Wester Fordel, Milnathort), 1 Moray Place, Edin.  
 1875 Kirkness, John, Quoyosty, Rousay, Orkney  
 1868 Kirkpatrick, A., of Allanshaw, Hamilton  
 1860 Kirkpatrick, Samuel, West Roucan, Dumfries  
 1866 Kirkwood, Alex., Edinburgh, Medalist to the Society  
 1871 Kirkwood, Allan, Killermont, Maryhill, Glasgow  
 1854 Kirkwood, Hugh, Killermont, Maryhill, Glasgow  
 1867 Knight, Wm. Gray, of Jordanstone, Meigle  
 1858 Knowles, Thomas, Flesher, Aberdeen

Admitted

- 1871 Knox, George, Polnoon Lodge, Eaglesham  
 1874 Knox, Robert, Woodside, Cambus, Alloa  
 1869 Kynoch, George, jun., Isla Bank Mills, Keith  
 1872 Kynoch, Patrick, M.D., Greenlaw, Berwickshire  
 1870 La Cour, L. W., Vice-Consul of Denmark, Granton, Edinburgh  
 1863 Laidlay, J. W., of Seacliffe, North Berwick  
 1863 Laing, George, Wark, Coldstream  
 1856 Laing, John, Newburgh, Fife  
 1855 Laing, Thomas, 17 Palmerston Road, Edinburgh  
 1874 Laing, William, Skail, Thurso  
 1833 Laird, David, Newmanswalls, Montrose  
 1858 Laird, Geo. W., of Denfield, Arbroath  
 1871 Lamont, Charles, of East Bank, Kinross  
 1850 Lamont, Jas., of Knockdow, Greenock  
 1866 Lamont, Jn., 12 Henderson Row, Edin.  
 1854 L'Amoy, John Ramsay, of Dunkenny, Netherbyres, Ayton  
 1855 Landale, Andrew, Easthall, Cupar-Fife  
 1857 Landale, James, Woodmill, Auchtermuchty  
 1874 Landale, John, of Woodbank, Banker, Dunfermline  
 1855 Landale, Thomas, 4 Mayfield Terrace, Edinburgh  
 1871 Landale, Thomas, Woodmill, Dunshalt, Auchtermuchty  
 1867 Lang, Alex., Borthrickfield, Bridge of Weir  
 1849 Lang, Hugh M., Broadmeadows, Selkirk  
 1864 Lang, John, Bield, Gargunnoch  
 1854 Lang, William, Quinish House, Tobermory  
 1854 Langlands, James C., Bewick, Alnwick  
 1857 Latham, Patrick R., The Kames, Lanrick Castle, Stirling  
 1861 Latta, Mat. Rodger, Carmyle, Tollcross, Glasgow  
 1873 Latta, William, Darmalloch, Cumnock  
 1868 Lauder, Alex., Goshen, Musselburgh  
 1859 Lauder, Dewar, St Nicholas, St Andrews  
 1873 Lauder, William, Locherlou, Crieff  
 1863 LAUDERDALE, Right. Hon. the Earl of, Thirlestane Castle, Lauder  
 1848 Laurie, Wm. Kennedy, of Woodhall, Castle-Douglas  
 1868 Law, James, East Mains, Broxburn  
 1868 Lawes, I. B., Rothamstead, St Albans  
 1873 Lawie, Alex., Implement and Manure Merchant, Laurencekirk  
 1874 Lawrence, James, Forbes Mills, Forbes  
 1872 Lawrie, Alex., Hardens, Dunse  
 1859 Lawrie, James, Mitchelston, Stow  
 1873 Lawrie, John, Kirklandhill, Leven

## Admitted

- 1872 Lawrie, John W., Mitchelston, Stow  
 1872 Lawrie, Thos., Esperston, Gorebridge  
 1872 Lawrie, Thos., Seed Merchant, Melrose  
 1875 Lawrie, Wm., Architect, Inverness  
 1858 Lawson, Alex., of Buntui, Kettle  
 1843 Lawson, Alexander, Merchant, Dundee  
 1854 Lawson, Alexander, Old Mills, Elgin  
 1846 Lawson, Chas., 34 George Square, Edin.  
 1871 Lawson, Charles, Deebank, Cults, Aberdeen  
 1868 Lawson, C., Ordhead, Cluny, Aberdeen  
 1868 Lawson, Geo. Stoddart, late Edinburgh  
 1859 Lawson, Henry Graham, late Edinburgh  
 1872 Lawson, James, Banker, Huntly  
 1867 Lawson, Thomas, of Carriston, Markinch  
 1858 Lawson, Wm., Lessendrum, Huntly  
 1858 Learmonth, Alex., North Bank, Bo'ness  
 1868 Learmonth, Lieut.-Col. Alex., of Dean, M.P., 73 Eaton Place, London  
 1874 Learmonth, Jas., Flesher, Linlithgow  
 1869 Learmonth, Thomas Livingstone, of Park Hall, Linlithgow  
 1868 Lee, John, Dollar Bank, Dollar  
 1855 Lees, John, Marvingston, Haddington  
 1868 Lees, Richard, Drinkstone, Hawick  
 1861 Lees, Robert, Leabrae, Galashiels  
 1823 Leigh, Rev. Peter, Golborne Park, Lancashire  
 1864 Leishman, James, of Broomrig, Dollar  
 1864 Leishman, T., Meiklewood, Gargunock, Stirling  
 1858 Leitch, Arch. K., Inchstelly, Forres  
 1841 Leith, Alex., of Freefield, Glenkindie, Inverkindie  
 1873 LEITH, Sir Geo. H., of Ross, Bart., Ross Priory, Alexandria  
 1874 Leith, James Forbes, of Whitechough, Alford, Aberdeenshire  
 1869 Leith, Major Thomas, Westhall, Oyne  
 1857 Lennie, John, Long Newton, Gifford  
 1873 Lennox, James, Doune of Glendouglas, Luss  
 1865 Leny, W. Macalpine, of Dalswinton, Dumfries  
 1840 Leslie, G. A. Young, of Kininvie, Lesmurdie House, Elgin  
 1862 LESLIE, Hon. George Waldegrave, Leslie House, Leslie  
 1857 Leslie, James, Thorn, Blairgowrie  
 1868 Leslie, Lieut.-Col. Jonathan Forbes, of Rothie Norman, Rothie Norman  
 1873 Leslie, Robert C., of Butterglen, Dunkeld  
 1873 Leslie, Wm., of Nethermuir, Aberdeen  
 1848 Leslie, Wm., of Warthill, Pitcaple  
 1868 Lesslie, James, Boghall, Linlithgow  
 1869 Liddell, Rev. John R., The Manse, Kirkliston

## Admitted

- 1864 Lidderdale, Wm. H., Writer, Castle-Douglas  
 1858 Ligertwood, John, Sheriff-Clerk, Aberdeen  
 1872 Lillie, Wm., Implement Maker, Berwick-on-Tweed  
 1841 Lindsay, Alexander K., of Balmungo, St Andrews  
 1843 Lindsay, D., Ardargie, Bridge of Earn  
 1873 Lindsay, Jas., Whitecastles, Lockerbie  
 1857 Lindsay, James, New Zealand  
 1865 Lindsay, John, Thornhill, Stewarston  
 1862 Lindsay, Robert, Lilliehill Fireclay Works, Dunfermline  
 1857 Lindsay, Thomas, Flemington Mill, Lamancha  
 1869 Lindsay, Thos. S., 10 Chalmers Crescent, Edinburgh  
 1854 Lindsay, William, 7 Hermitage Hill, Leith  
 1855 Lindsay, W., Stanhope, Biggar  
 1873 Linton, Simon, Glenrath, Manor, Peebles  
 1863 Lithgow, E., Bedshiel, Greenlaw, Dunse  
 1869 Little, James, Fauld, Longtown  
 1859 Little, John, Meikleholmside, Moffat  
 1870 Little, Wm., Burnfoot, Ewes, Langholm  
 1863 Livingston, Thos. S. Fenton, of West Quarter, Mayfield House, Airdrishaig  
 1853 Loch, George, Q.C., London  
 1861 Lochhead, T., Hilton, Rothesay  
 1832 Lockhart, Allan Elliott, of Borthwickbrae, Hawick  
 1857 Lockhart, Rev. Laurence, D.D., of Milton-Lockhart, Carluke  
 1866 Lockhart, Robert, jun., 17 North Merchiston Place, Edinburgh  
 1872 LOCKHART, Sir Simon M., of Lee and Carnwath, Bart., Lanark  
 1870 Lockhart, Captain W. Elliott, yr. of Borthwickbrae, Hawick  
 1859 Lockie, Wm., West Morriston, Earliston  
 1872 Logan, Abraham, Hownam Grange, Kelso  
 1831 Logan, Alexander, London.  
 1869 Logan, Jas., of Eastshield, Carnwath  
 1872 Loney, Peter, Marchmont, Dunse  
 1852 Longmore, Andrew, Reitie, Banff  
 1837 Longmore, John Alex., W.S., Edin.  
 1858 Longmore, William, Banker, Keith  
 1865 Lorimer, J., Achrossan, Tigh-na-bruaich  
 1843 Lorimer, T. W., Mountrule, Douglas, Isle of Man  
 1860 Lorimer, William, Rigg, Sanquhar  
 1869+LORNE, Most Noble the Marquis of, K.T., M.P.  
 1869+LOTHIAN, Most Noble the Marquis of, Newbattle Abbey, Dalkeith

# *Highland and Agricultural Society, 1875.*

## Admitted

- 1874 Lothian, Maurice John, Glenlora, Lochwinnoch
- 1820† Lovat, Right Hon. Lord, K.T., Beaufort Castle, Beaully
- 1853† Lovat, Hon. Simon Fraser, Master of, Phoincas House, Beaully
- 1874 Love, James, 1 Dellingburn Street, Greenock
- 1857 Lovie, Alex., Nether Boyndlie, Fraserburgh
- 1843 Low, James, Berrywell, Dunse
- 1854 Low, James, Yonderton, Ellon
- 1861 Low, General Sir John, of Clatto, K.C.B., Cupar-Fife
- 1861 Lowe, Robert, General Agent, Perth
- 1850 Lowndes, James, of Arthurlee, Barrhead
- 1871 Lowson, William, of Balthayock, Perth
- 1859 Luke, John, Abbotsford Crescent, St Andrews
- 1871 Lumsdaine, Archd., C. A., Mansion House, Greenock
- 1862 Lumsdaine, Stamford R., of Lathallan, Colinsburgh
- 1861 Lumsden, David, Pitcairnfield, Perth
- 1850 Lumsden, G., Leslie Lodge, Inverurie
- 1857 Lumsden, George, Glasgow
- 1869 Lumsden, Henry, of Pitcairle, Pitcairle
- 1844 LUMSDEN, Sir James, of Arden, Glasgow
- 1840 Lumsden, James, Braco, Keith
- 1841 Lumsden, William James, of Balmedie, Belhelvie, Aberdeen
- 1870 Lusk, And., Howell, Kirkcudbright
- 1861 Lyal, Robert, Farmhall, Bridge of Earn
- 1850 Lyall, Chas., Old Montrose, Montrose
- 1854 Lyall, David, of Gallery, Montrose
- 1850 Lyall, Robert, Carcary, Brechin
- 1872 Lyall, William, Fogorig, Dunse
- 1861 Lyell, John, Banker, Newburgh
- 1859 Lyon, Jas., Burnhaugh, Stonehaven
- 1867 Lyon, G. F., of Kirkmichael, Captain R.N., Dumfries
- 1870 Lyon, Thomas A., Foxwood, Parkgate, Dumfries
- 1871 Lyon, William, Newton of Drum, Aberdeen
- 1870 M'Adam, Jas. Nicol, 30 Powis Square, Kensington Park, London, W.
- 1857 Macadam, John, Blairover, Drymen
- 1859 Macadam, Dr Stevenson, F.R.S.E., Surgeons' Hall, Edinburgh
- 1840 Macalister, A., of Loup and Torrisdale
- 1842 Macalister, Keith, of Glenbarr, Tarbert
- 1855 M'Alister, Robt., Mid Ascoig, Rothesay
- 1872 Macallum, Donald, Balligowan, Oban
- 1873 M'Alpine, James, Tile Manufacturer, Stirling

## Admitted

- 1854 Macandrew, D. M., 16 York Place, Edinburgh
- 1873 MacAndrew, Henry C., Sheriff-Clerk, Inverness
- 1862 M'Arthur, John, of Barbreck, Banker, Inveraray
- 1840 Macarthur, Major Alexander
- 1842 Macarthur, Duncan, New Zealand
- 1840 Macasgill, Donald, of Rhudunan, New Zealand
- 1873 McAuslan, James, Kirkmichael, Row
- 1872 McAuslan, John, Inverlaran, Row
- 1853 M'Auslan, J., Kilbridegar, Cairnadow
- 1872 M'Barnet, Colonel, A. C., New Club, Edinburgh
- 1854 MacBey, Peter, Land-Surveyor, Elgin
- 1865 M'Bean, D., Auchterblair, Carr Bridge
- 1871 McBean, John, Factor's Office, Grantown
- 1870 Macbean, Colonel William, of Tomatin, Inverness
- 1871 McBeath, James, Brims, Thurso
- 1868 Macbraire, James, of Broadmeadows, Berwick
- 1870 M'Call, George, Burrance, Courance, Lockerbie
- 1871 M'Call, James, Broomfield, Minnyhive, Thornhill
- 1868 M'Call, Professor J., Veterinary College, Glasgow
- 1846 M'Call, Henry, of Daldowie, Glasgow
- 1874 McCallum, Alex. Inglis, Chemist and V.S., 5 Grassmarket, Edinburgh
- 1872 McCallum, Dun., Glenamachrie, Oban
- 1842 M'Callum, George Kellie, of Braco, Perthshire
- 1843 M'Callum, J., Plewlands, Lothian Burn
- 1861 M'Callum, John, Crieff
- 1864 M'Callum, John, Fendoch, Crieff
- 1859 M'Candlish, Jun. M'Gregor, W.S., Edinburgh
- 1871 McCash, John, Grain Merchant, Perth
- 1873 McCaull, Peter, Dykedale, Dunblane
- 1851 M'Caw, Alex., Greysowthen, Carlisle
- 1857 M'Ohlory, Henry, London
- 1851 M'Clean, Alex. H., Auchneel, Stranraer
- 1870 M'Clew, John, Dinvin, Portpatrick
- 1870 M'Clymont, James, Borgue House, Kirkcudbright
- 1843 M'Coll, Donald, Appin House, Appin
- 1840 M'Combie, J. Boyn, Advocate, Aberdeen
- 1858 M'Combie, Peter, Upper Farmton, Whitehouse, Aberdeen
- 1858 M'Combie, Robt., Brawliemuir, Drumlithie
- 1840 M'Combie, William, of Easter Skene, Skene

Admitted		Admitted	
1847	M'Combie, William, M.P., Tillyfour, Aberdeen	1861	Macdonald, Peter, The Douglas Hotel, Brodick, Ardrossan
1857	M'Connachy, Archibald, Macremore, Campbeltown	1868	Macdonald, R., Cluny Castle, Aberdeen
1858	M'Connach, Chas., Cairnballoch, Alford, Aberdeen	1874	MacDonald, R. A., Ullinish, Portree
1868	M'Connel, Frederic, of Robgill, 8 Coates Gardens, Edinburgh	1839	Macdonald, Roderick C., of Castle Teirim, Prince Edward's Island
1874	M'Connel, William, of Knockdolian, Girvan	1861	Macdonald, William, of Balnakilly, Blairgowrie
1870	M'Connell, James, Glasnick, Newton-Stewart	1874	MacDonald, William, Editor, <i>North British Agriculturist</i> , Edinburgh
1842	M'Connell, John, Richmond, Surrey	1871	M'Donald, William, Railway Station, Perth
1856	M'Cowan, Robert, 12 Lynedoch Place, Glasgow	1860	Macdonald, William S., Craigielaw, Drem
1850	M'Cracken, John, the Drum, Dumfries	1865	Macdonald, William, Caledonian Bank, Elgin
1859	M'Culloch, Alexander, of Glen, Gatehouse of Fleet	1844	Macdonald, Lieut.-Col. Wm. Macdonald, of St Martin's, Perth
1870	M'Culloch, David, Bank-Agent, North Berwick	1846	Macdonell, Eneas Ranald, of Morar, Edinburgh
1870	M'Culloch, John, Agnew Crescent, Stranraer	1865	M'Douall, Jas., of Logan, Stranraer
1872	M'Culloch, John H., Skaith, Penninghame, Newton-Stewart	1847	M'Dougal, Alexander, Granton Mains, Edinburgh
1869	M'Culloch, R. C., Kirkland of Longcastle, Kirkinner	1868	M'Dougal, George, Blythe, Lauder
1849	M'Culloch, Walter, of Ardwell, Gatehouse of Fleet	1874	M'Dougall, Alex., 5 Dixon Street, Glasgow
1871	M'Culloch, William, Crieff	1872	M'Dougall, Col. Chas. A., of Dunollie, Oban
1858	M'Diarmid, Charles A., Rockwood, Killin	1871	M'Dougall, John, Goodlyburn, Perth
1858	M'Diarmid, D. A., Killimore, Auchnacraig, Mull	1829	Macdougall, Allan, W.S.
1838	M'Donald, Dr Alex., Prince Edward's Island	1860	M'Dougall, Archibald, Milltown, Ardalanais, Kenmore
1841	Macdonald, Alexander, Wine Merchant, Inverness	1865	M'Dougall, James, Lylestone, Lauder
1854	Macdonald, A., Balranald, Lochmaddy	1838	Macdougall, Captain James Patrick
1874	Macdonald, Alex., Nether Largie, Kilmartin	1853	M'Dougall, John, Kerrytonlia, Rothesay
1874	MacDonald, Alex. Ronald, Ord, Skye	1871	M'Dougall, John W., yr. of Orchill, Blackford
1855	Macdonald, A. S., Cyderhall, Dornoch	1870	M'Dowall, Andrew, Auchtralure, Stranraer
1841	Macdonald, Col. Alister M'lan, of Dalchosnie, Pitlochry	1870	M'Dowall, Andrew, Malcolmstone, Hermiton
1857	Macdonald, Angus, Banker, Callander	1845	Macdowall, Henry, of Garthland, Lochwinnoch
1868	MacDonald, A., Friarton, Perth	1874	Macduff, Alex., of Bonhard, 3 Merchiston Place, Edinburgh
1860	Macdonald, D., Athole Arms Hotel, Blair Athole	1859	MacDuff, James, Newmill, Stanley
1868	M'Donald, Donald, Culraggie, Alness	1834	Macewan, J., of Tar of Ruskie, Callander
1872	M'Donald, Donald, Tormore, Broadford	1846	M'Ewan, Alexander, late of Sunderland
1869	Macdonald, D. J. K., of Sanda, 7 Craven Street, London	1850	M'Ewan, John, Merchant, Glasgow
1865	Macdonald, D. P., of Invernevis, Fort-William	1864	M'Ewen, John, Redside Farm, North Berwick
1857	Macdonald, Harry, Banker, Portree	1865	M'Ewen, John, Merchant, Stirling
1871	M'Donald, James, Comrie Farm, Aberfeldy	1865	MacEwen, John C., Inverness
1878	Macdonald, John, Porterfield, Renfrew	1873	M'Ewen, William, Cambushinnie, Dunblane
1873	M'Donald, Neil M'Leod, of Dunach, Oban	1851	M'Farlan, John, Faslane, Gareloch-head



Admitted

- 1874 Macfarlane, Alex., Mealldarroch, Tarbert, Lochfine  
 1857 Macfarlane, Alexander, Pollanilline, Campbeltown  
 1873 M'Farlane, Colin, Greenfield, Row  
 1857 Macfarlane, Donald, Achray, Aberfoyle  
 1860 Macfarlane, Donald, Balmuldy, Bishop-  
 1873 M'Farlane, Duncan, Greenfield, Row  
 1857 Macfarlane, Duncan, Torr, Helensburgh  
 1869 M'Farlane, James, Dunfermline  
 1857 Macfarlane, John, of Ballenclerach, Lennoxton  
 1872 Macfarlane, John, Barnacarry, Kilninver, Oban  
 1873 Macfarlane, Lewis, Lettermay, Lochgoilhead  
 1868 Macfarlane, Malcolm, Bridge of Tilt, Blair Athole  
 1862 Macfie, C., of Gogarburn, Corstorphine  
 1865 Macfie, David J., of Borthwick Hall, Heriot  
 1864 Macfie, Robert Andrew, of Dreghorn, Slateford  
 1860 Macfie, Samuel, 29 Whitefield Road, Everton, Liverpool  
 1869 Macfie, William, of Clermiston, Corstorphine  
 1865 M'Gavin, Robert, of Ballumbie, Dundee  
 1863 M'Gibbon, David, late Inveravon, Polmont  
 1863 M'Gibbon, David, Architect, Edinburgh  
 1850 M'Gill, J., Torrorie, Dumfries  
 1860 M'Gill, James, Rôtchell, Dumfries  
 1850 M'Gill, John, Barsalloch, Wigtown  
 1867 M'Gillewie, Donald, Pitlochry  
 1874 M'Gillivray, John, Ballachroan, Kingussie  
 1870 M'Gowan, William, Blegbie, Upper Keith  
 1837 Macgregor, Alexander, London  
 1872 M'Gregor, Donald, Ballinluig  
 1870 M'Gregor, Donald, Royal Hotel, Edinburgh  
 1857 Macgregor, D.R., M.P., Merchant, Leith  
 1874 MacGregor, Rev. J., Knockbain Manse, Munlochry  
 1865 M'Gregor, James, Balmenach, Grantown  
 1874 M'Gregor, James G., Mulderg, Fearn  
 1861 M'Gregor, John, Ladywell, Dunkeld  
 1874 M'Gregor, P. Comyn, of Bredilend, Lonend House, Paisley  
 1868 MacGregor, R., St Ann's Brewery, Edinburgh  
 1874 M'Gregor, Roderick, of Brae Rannoch, Kingcraig, Kingussie  
 1865 MacGregor, Thomas, Millerton, Inver-

Admitted

- 1870 M'Haffie, William J., of Torhouse muir, Wigtown  
 1872 M'Ilraith, James, 135 Hope Street, Glasgow  
 1871 M'Ilwraith, Thomas, Barwhanny, Kirkcinner  
 1872 M'Indoe, James, Glenmollachan, Luss  
 1864 MacIndoe, Robert, Merkins, Alexandria  
 1831 M'Inroy, Jas. P., of Lude, Blair-Athole  
 1827 M'Inroy, Lieut.-Colonel William, of The Burn, Brechin  
 1864 M'Intosh, David, of Havering Park, Romford, Essex  
 1852 M'Intosh, Lieut.-Gen., of Campsie, K.H.  
 1865 M'Innes, Duncan, of Cowden, Comrie, Crieff  
 1873 M'Intyre, Daniel, Innkeeper, Pitlochry  
 1875 MacIntyre, Peter Brown, Mains of Findon, Dingwall  
 1875 M'Intyre, Robert, St Martins, Invergordon  
 1861 MacIntyre, Donald, Tighnablaier, Comrie  
 1844 MacIntyre, J., Lochvoil Cottage, Oban  
 1857 M'Isaac, John, Dunglass, Campbeltown  
 1850 M'Iver, Evander, Scourie, Lairg  
 1827 Macivor, John, New South Wales  
 1854 Mack, William, of Berrybank, Reston  
 1852 Mackay, Donald, Lythmore, Thurso  
 1869 Mackay, Donald, 9 West Mayfield, Edinburgh  
 1846 Mackay, George, of Bighouse  
 1872 Mackay, George G., Grangemouth  
 1870 Mackay, H. M. S., Banker, Elgin  
 1857 Mackay, John, Dalmally  
 1872 Mackay, John S., Banker, Grangemouth  
 1870 Mackay, R. J., Burgie, Forres  
 1874 Mackay, William, Melness, Lairg  
 1875 Mackay, Thomas, Mains of Newhall, Invergordon  
 1873 M'Kean, John, Grain Merchant, Stirling  
 1857 M'Kean, Robert, Lumloch, Bishopbriggs  
 1870 M'Keand, Andrew, of Airles, Wigtown  
 1855 M'Kechnie, Neil, Dunoon  
 1864 Mackechnie, James, Glenmore, Lochgilphead  
 1869 Mackechnie, James, jun., Glenmore, Kilmefort, Lochgilphead  
 1841 MACKENZIE, Right Hon. Lady Anne of Scatwell  
 1848 MACKENZIE, Hon. Lord, 12 Great Stuart Street, Edinburgh  
 1853 Mackenzie, Alexander, Banker, Elgin  
 1874 Mackenzie, Alex., East Kinkell, Dingwall

## Admitted

- 1865 Mackenzie, Alexander, Flora Cottage, Nairn  
 1862 MACKENZIE, Sir Alexander M., of Delvine, Bart., Dunkeld  
 1846 Mackenzie, A., of Scatwell, 19 Charlotte Square, Edinburgh  
 1869 Mackenzie, Alexander Kincaid, of Ravelrig House, Currie  
 1875 Mackenzie, Alex., Merchant, 22 Church Street, Inverness  
 1872 Mackenzie, Andrew, Dalmore Distillery, Alness  
 1855 Mackenzie, Captain Boyce, Creich, Bonar Bridge  
 1872 Mackenzie, Colin, W.S., 28 Castle Street, Edinburgh  
 1869 Mackenzie, C. J., of Portmore, Eddleston  
 1844 Mackenzie, Daniel, jun., Merchant, Glasgow  
 1855 Mackenzie, Don., Balnabeen, Dingwall  
 1858 Mackenzie, Donald (late Bellevue, Beaulieu), America  
 1846 MACKENZIE, Sir Evan, of Kilcoy, Bart.  
 1833 MACKENZIE, Right Hon. Holt, 28 Wimpole Street, London  
 1870 Mackenzie, James, Belmont, Innishannon  
 1865 Mackenzie, James Fowler, of Allangrange, Munloch  
 1868 Mackenzie, Captain James Dixon, of Findon, Mountgerald, Dingwall  
 1838 MACKENZIE, Sir James J. R., of Scatwell, Bart.  
 1871 Mackenzie, James T., of Kintail and Glenmutick  
 1835 Mackenzie, Jn., of Glack, Old Meldrum  
 1848 Mackenzie, John, Edinburgh  
 1853 Mackenzie, Jn. Mouro, of Mornish, Garrion Tower, Wishaw  
 1869 Mackenzie, John, Barnhill, Dumfries  
 1848 Mackenzie, John Ord, of Dolphinton, W.S., Edinburgh  
 1821 Mackenzie, John Whitefoord, W.S., Edinburgh  
 1865 Mackenzie, John, Duchlague, Cove, Greenock  
 1872 Mackenzie, John, of Knipoch, Oban  
 1854 MACKENZIE, Sir K. S., of Gairloch, Bart., Conon House, Dingwall  
 1846 Mackenzie, K. W. Stewart, of Seaforth, Brahan Castle, Dingwall  
 1848 Mackenzie, Kenneth, C.A., Edinburgh, Auditor of Accounts to the Society  
 1874 Mackenzie, Nigel Banks, British Linen Bank, Fort-William  
 1838 Mackenzie, Robert D., of Caldervan, Alexandria  
 1865 Mackenzie, Roderick G., of Flowerburn, Fortrose

## Admitted

- 1846 Mackenzie, Thomas, of Ord, Beaulieu  
 1852 Mackenzie, William, Unthank, Inchture  
 1862 Mackenzie, William, Achindunie, Alness  
 1857 M'Kerral, A., Brunerican, Campbelltown  
 1874 M'Kerrow, And., Auchenskeoch, Southwick, Dumfries  
 1865 Mackessack, J., Earnside, Forres  
 1865 M'Kessack, Charles, Culblair, Fort-George Station  
 1857 M'Kessack, John, Balnafferry, Forres  
 1874 Mackessack, John, Kinloss, Forres  
 1864 M'Kessack, Robert, of Ardcygo and Roseisle, Forres  
 1874 Mackie, Alexr., Bandoath, Stirling  
 1860 Mackie, George, of Dunjarg, Castle-Douglas  
 1873 Mackie, James, Invermay, Bridge of Earn  
 1869 Mackie, James, Lewes, Fyvie  
 1864 Mackie, James Logan, Lagavulin, Islay  
 1860 Mackie, John, Sarkshields, Ecclefechan  
 1857 Mackie, Robert, Loudoun, Galston  
 1871 Mackie, William, Petty, Fyvie  
 1872 Mackinlay, Daniel, 11 James Street, Portobello  
 1818 Mackinlay, John, Whitehaven  
 1869 M'Kinlay, John, Hardhill, Bathgate  
 1870 M'Kinnell, John, Machermore, Newton-Stewart  
 1860 M'Kinnell, J. B. A., Dumfries  
 1869 Mackinnon, Lachlan, jun., Advocate Aberdeen  
 1873 Mackintosh, Alex., Æneas, of Mackintosh, Moy Hall, Inverness  
 1865 Mackintosh, C. Fraser, of Drummound, M.P., Inverness  
 1839 Mackintosh, Æneas, of Daviot, Inverness  
 1846 Mackintosh, Æneas, of Balnespick, Inverness  
 1844 Mackintosh, Æneas W., of Raigmor, Inverness  
 1844 Mackintosh, A., of Holm, Inverness  
 1868 Mackintosh, C. H. (of Dalmonzie, Perthshire), M.D., Morden Hall, Torquay  
 1846 Mackintosh, George Gordon, Richmond House, Twickenham, Middlesex  
 1869 Mackintosh, James, of Lamancha, Lamancha  
 1854 Mackintosh, R. T., Seedsmen, Edinburgh  
 1874 M'Kirdy, Major-General D. Elliot (of Letham, Lanarkshire), New Club, Edinburgh

Admitted

- 1850 M'Kirdy, John Gregory, of Birkwood, Lesmahagow  
 1860 M'Knight, Alexander, London  
 1856 MacLachlan, Alexander, Carleith, Dun-  
 tocher  
 1873 M'Lachlan, Archd., 32 Queen Street,  
 Stirling  
 1873 M'Lachlan, Colin, Woodend, Row  
 1874 M'Lachlan, D., Lochgilphead  
 1843 MacLachlan, George, of MacLachlan,  
 W.S., Edinburgh  
 1872 MacLachlan, James, Doune Lodge,  
 Burn of Cambus, Doune  
 1862 MacLachlan, W. A., of Auchentroig,  
 Balfron  
 1853 MacLagan, D., M.D., Prof. of Medical  
 Jurisprudence, University of Edin-  
 burgh  
 1869 MacLagan, David, C.A., 22 George  
 Street, Edinburgh  
 1847 MacLagan, Peter, Birchwood, Birnam,  
 Dunkeld  
 1847 MacLagan, Peter, of Pumpherston, M.P.,  
 Almondell, Mid-Calder  
 1873 MacLagan, Robert Craig, M.D., 5 Coates  
 Crescent, Edinburgh  
 1847 MacLaine, Hugh, Glenrisdell, Tarbet,  
 Kintyre  
 1870 MacLaine, Murdoch G., of Lochbuy,  
 Oban  
 1855 MacLanachan, James, Van Diemen's  
 Land  
 1859 MacLaren, D., Corrychrone, Cal-  
 lander  
 1869 M'Laren, David, Mill of Inverarity,  
 Forfar  
 1853 M'Laren, Duncan, M.P., Newington  
 House, Edinburgh  
 1873 M'Laren, James, Little Sauchie, St  
 Ninians  
 1830 MacLaren, Dr John, Blairgowrie  
 1871 M'Laren, James, Solicitor, Crieff  
 1864 M'Laren, J., late Gogar Park, Corstor-  
 phine  
 1873 M'Laren, John, Craggish, Comrie  
 1858 M'Laren, John, 15 York Place, Perth  
 1859 M'Laren, John, Brac of Monzievaird,  
 Crieff  
 1859 M'Laren, Joseph (late Greenhead of  
 Arnot, Kinross), Australia  
 1875 M'Lathie, William, Hillside, Camp-  
 beltown  
 1835 Maclean, Alexander, of Pennycross,  
 Auchnacraig, Mull  
 1835 Maclean, Colonel Allan Thomas  
 1837 Maclean, Archibald D., London  
 1871 M'Lean, Charles, of Glenearn, Bridge  
 of Earn  
 1838 Maclean, Colin, of Lagan, Islay  
 1873 M'Lean, Daniel, Kersie Mains, Stirling

Admitted

- 1861 Maclean, Duncan, Bellnolow, Crieff  
 1849 Maclean, George, Paisley Road, Glas-  
 gow  
 1854 Maclean, Hector Frederick, W.S.,  
 Edinburgh  
 1857 M'Lean, James, Bennetsfield House,  
 Fortrose  
 1860 Maclean, J., Clerk of Supply, Wigtown  
 1869 M'Lean, James, Hotel, Kilmartin  
 1860 M'Lean, Lauchlan, Pitlith, Aberfeldy  
 1823 Maclean, Dr Lachlan, Helenlee, Oban  
 1846 Macleay, Alex. D., Conservative Club,  
 London  
 1839 Macleay, Kenneth, 16 Grosvenor  
 Street, London  
 1875 M'Leish, Dan., Bank of Scotland,  
 Fort-William  
 1871 M'Lellan, David, of Marks, Kirkcud-  
 bright  
 1871 M'Lellan, Peter, Grant Farm, Bridge  
 of Earn  
 1857 Maclellan, T., North Balfarn, Kirk-  
 inner  
 1865 MacLennan, Alexander F., late Meikle  
 Urchany, Nairn  
 1875 MacLennan, Alexander, Leanassie,  
 Kintail  
 1865 MacLennan, Donald, junior (late Hil-  
 ton, Beaulieu), South America  
 1864 MacLennan, John, Carnoch, Strath-  
 conon, Beaulieu  
 1874 MacLennan, James, Fornightly, Nairn  
 1830 Macleod, Donald, Coulmore, Inver-  
 ness  
 1874 Macleod, Dun. D. M'L., Coulmore,  
 Inverness  
 1849 Macleod, John N., Banker, Kirkcaldy  
 1839 Macleod, Norman, of Dalvey, Forres  
 1839 Macleod, Norman, of Macleod, London  
 1854 Macleod, R. B. Æneas, of Caiboll, In-  
 vergordon Castle, Invergordon  
 1865 M'Leod, W. A., Scorrybreck, Portree  
 1875 Macleod, Captain, of Orbst, Rum  
 1874 M'Master, Allan, Glenhead House,  
 Stranraer  
 1871 M'Master, Hugh, Blairbuie, Port-  
 William  
 1875 M'Master, John, Culhorn Mains,  
 Stranraer  
 1875 M'Master, William, Challock, Glenluce  
 1870 M'Millan, John, of Glencrosh, Moni-  
 aive  
 1861 M'Millan, J. G., Blairlomond, Stafford  
 Street, Helensburgh  
 1872 M'Millan, Robert, Polgowan, Newton  
 Stewart  
 1854 M'Minn, F., 1 Graham Street, Edin-  
 burgh  
 1870 M'Monnies, James, Culquha, Ring-  
 lord, Castle-Douglas

Admitted		Admitted	
1872	M'Murich, James, Stuckievulich, Arrochar	1827	Macpherson, Ewen, of Cluny Macpherson, Cluny Castle, Kingussie
1873	M'Murich, Peter, Kennet Village, Alloa	1872	Macpherson, George G., Cat Lodge, Kingussie
1865	M'Nab, Alexander, of Techmuiry, Glenochil House, Menstrie	1856	Macpherson, James, late Nairn
1873	M'Nab, Donald, Duchlage, Luss	1865	Macpherson, James, Clunas, Cawdor, Nairn
1873	M'Nab, Jas., Loaning Bank, Menstrie	1856	Macpherson, John, Blantyre, Glasgow
1872	M'Nab, John, Hotel, Arrochar	1857	Macpherson, J., Lord Chamberlain's Office, London
1873	M'Nab, John, Bracklin, Callander	1860	Macpherson, J. (late Killihuntly, Kingussie), Ontario, Canada
1865	Macnaghten, Steuart, of Inver Trosachs, Bitterne Manor House, Southampton	1870	Macpherson, Colonel Lachlan, of Glen-truin, Newtonmore
1857	M'Nair, James, Smerby, Campbeltown	1871	M'Pherson, Lauchlan, Laggan, Crieff
1857	M'Nair, John, 33 Moray Place, Edinburgh	1857	M'Queen, J., of Boquhapple, Thornhill, Stirlingshire
1857	M'Naughton, Alex., Remony, Kenmore	1870	Macqueon, James, of Crofts, Dalbeattie
1859	M'Naughton, Alexander, Kerrowmore, Glenlyon, Aberfeldy	1873	MacQueen, James, Divers Wells, Alloa
1871	M'Naughton, Alexander, Banker, Pitlochry	1839	Macrae, Archibald, M.D., late Bruiach, Inverness-shire
1866	Macnaughton, Alexander, S.S.C., Edinburgh	1850	Macrae, Don., Vallay, North Uist
1870	M'Naughton, Daniel, North British Agricultural Company, Leith	1874	Macrae, Dun. A., Fernaig, Strome Ferry
1854	Macnaughton, J., of Smithfield, Stand-alone House, Stewarton, Kilmarnock	1873	M'Rae, Ewen, Leackachan, Glenshiel, Lochalsh
1871	M'Naughton, John, Kerrowmore, Glenlyon, Aberfeldy	1874	MacRae, Rod., Mains of Eockless, Beaully
1871	M'Naughton, Wm., Lochs, Glenlyon, Aberfeldy	1831	Macrithie, Thomas Elder, of Craigton, W.S., Edinburgh
1848	Macneal, H., of Ugadale, Campbeltown	1868	M'Robbie, Peter, Sunnyside, Aberdeen
1870	M'Neill, Alexander, Redcastle, Dalbeattie	1871	MacRosty, James, Solicitor, Crieff
1868	M'Neill, Colonel A. C., Redford House, Colinton	1873	Macaggart, Charles, Banker, Campbeltown
1846	M'NEILL, Right Hon. Sir John, G.C.B., Burnhead, Liberton	1874	Mactavish, Alex., Implement Maker, Inverness
1857	M'Neill, Robert, Letter, Killearn	1857	M'Tavish, Duncan, America
1860	M'Neill, John, Carstairs, of Ardlussa, Jura	1848	Mactier, Alexander Walker, 10 Royal Crescent, Weymouth
1861	M'Neillie, W., of Castlehill, Dumfries	1828	Macvicar, Rev. J. G., D.D., Moffat
1873	M'Nicol, John, Courshelloch, Clachan, Tarbet	1869	M'William, D., Cairnfield, Kirkcinner
1857	M'Niven, Alex., Inneshevan, Killin	1870	M'William, Robert, Craichmore, Stranraer
1869	M'Niven, David, sen., Cattle Salesman, Haddington	1839	Madden, Henry R., M.D., Australia
1852	Maconchie, Robert Blair, of Gattonside, W.S., Edinburgh	1870	Main, George Agnew, Banker, Carlisle
1874	Macphail, Alex., Culaird, Inverness	1874	Main, James A. R. (A. and J. Main & Co.), Renfield Street, Glasgow
1857	M'Phail, Alexander, America	1847	Maitland, Sir Alex. C. R. Gibson, of Clifton Hall, Bath
1875	M'Phail, Archibald, Callochoille, Aros, Mull	1852	Maitland, George F., of Hermand, Stoneyfield House, Inverness
1871	MacPherson, Donald, Glen Nevis, Fort-William	1871	Maitland, Henry, Hillfoot, Duddingston
1865	Macpherson, Col. D. E. B., of Belleville, Kingussie	1858	Maitland, James, jun., Little Methlic, Methlic
1866	Macpherson, Duncan, Banker, Kingussie	1867	Maitland, James Ramsay Gibson, yr. of Clifton Hall, Ratho
		1858	Maitland, William, Netherton, Inch
		1841	Makgill, G., of Komback, Cheltenham

Admitted

- 1860 Malcolm, George, Factor, Invergarry  
 1840 Malcolm, W. E., of Burnfoot, Langholm  
 1861 Mangles, George, Givendale, Ripon, Yorkshire  
 1847 Mann, John, Glasgow  
 1840 MANSEL, Sir John, Bart., Maestilo, Llandilo, Carmarthenshire  
 1833+MANSFIELD, Right Hon. the Earl of, K.T., Scone Palace, Perth  
 1869 Mansfield, James L., Advocate, Edin.  
 1855 MARJORIBANKS, Sir Dudley Coutts, of Guisachan, Bart., 3 Grafton St., London  
 1854 MARJORIBANKS, Sir John, of Lees, Bart., Coldstream  
 1856 Marjoribanks, John, Roseneath  
 1854 Marjoribanks, Wm., Warriston House, Inverleith Row, Edinburgh  
 1864 Marr, J. A., late of Alderston, Mid-Calder  
 1855 Marr, Wm. Smith, Upper Mill, Tarves  
 1873 Marryat, George Selwyn, late 19 Hope Terrace, Edinburgh  
 1873 Marshall, James, of Duncrervie, Milnathort  
 1868 Marshall, Jas. (Marshall, Sons, & Co.), Gainsborough  
 1847 Marshall, John, Clebrig, Laing  
 1860 Marshall, Thomas, The Howes, Annan  
 1872 Marshall, William Hunter, of Callander, 25 Heriot Row, Edinburgh  
 1875 Martin, Donald T., Auchendennan, Bonhill  
 1875 Martin, Hugh, S.S.C., 137 Princes Street, Edinburgh  
 1858 Martin, James, Newmarket, Aberdeen  
 1874 Martin, John, Beechwood Mains, Corstorphine  
 1858 Martin, John, Claggan, Kenmore  
 1865 Martin, John, Shore, Kincardine-on-Forth  
 1867 Martin, John M., yr. of Auchendennan, Bloomhill, Cardross  
 1854 Martin, Dr N., of Glendale, Dunvegan  
 1870 Martin, William, of Dardarroch, Dumfries  
 1859 Mason, R., of Belgrave Park, Corstorphine Hill House, Corstorphine  
 1874 Masson, John, Kindrummond, Dorcas  
 1874 Masson, John, Mill of Cammie, Ban-chory  
 1874 Mather, John Arres, Hallrule, Hawick  
 1873 Mather, William, of Waterfoot, Mearns  
 1846 Matheson, Alexander, of Ardross, M.P., Ardross Castle, Alness  
 1843 MATHESON, Sir James, of The Lews, Bart., Lews Castle, Stornoway  
 1871 Matheson, Kenneth, Contractor, Provost of Dunfermline  
 1853 Mathews, N., Whitehills, Garliestown

Admitted

- 1864 Mathie, James, Banker, Stirling  
 1871 Matthew, P. M., of Newmill, Perth  
 1871 Maury, William, Solicitor, Perth  
 1870 Maxwell, Captain Heron, yr. of Springkell, Ecclefechan  
 1861 Maxwell, Edward Heron, of Teviotbank, Hawick  
 1865 Maxwell, Francis, of Gribton, Dunragit, Glenluce  
 1873 Maxwell, George, of Broomholm, Langholm  
 1838 MAXWELL, Hon. Henry Constable, of Milnhead  
 1839 MAXWELL, Sir John H., of Springkell, Bart., Ecclefechan  
 1867 Maxwell, Maxwell Hyslop, of The Grove, Dumfries  
 1869 Maxwell, General Harley, of Portrack, Dumfries  
 1857 Maxwell, R., Ballachgair, Campbeltown  
 1839 Maxwell, Wellwood H., of Munches Dalbeattie  
 1840 MAXWELL, Sir W., of Monreith, Bart., Port William  
 1841 MAXWELL, Sir W., of Cardoness, Bart., Catehouse  
 1873 Maxwell, William Jardine, yr. of Munches, Dalbeattie  
 1841 MAXWELL, Sir William Stirling, of Polloc, Bart., M.P., Keir, Dunblane  
 —Honorary Secretary of the Society  
 1875 Mearns, Rev. Duncan G., Minister of Oyne, Aberdeenshire  
 1859 Mears, William, 2 Windmill Street, Edinburgh  
 1875 Medley, Spencer M., Ellandonan Villa, Inverness, Commander R.N.  
 1857 Meiklam, John, of Gladwood, Melrose  
 1854 Meikle, David, late Clunne Mains, Kinglassie  
 1858 Meikle, James, Nether Mains, Kilwinning  
 1867 Meikle, John, Seafeld, Bathgate  
 1869 Meikle, William, East Breich, West Calder  
 1862 Meiklejohn, John, Foundry, Dalkeith  
 1861 Mein, Andrew Whytock, of Hunthill, Jedburgh  
 1863 Mein, Benj., Roxburgh Barns, Kelso  
 1860 Mein, N. A., Marsh House, Canonbie  
 1863 Mein, William, Seedsman, Kelso  
 1857 Meldrum, D., of Craigfoodie, Cupar-Fife  
 1863 Meldrum, Edward, of Dechmont, Uphall  
 1869 Meldrum, J., of Eden Bank, Pittormie, Cupar-Fife  
 1854 Melrose, J., Newbigging, Norham, Berwick-on-Tweed

Admitted	Admitted
1869 Melrose, Patrick, West Loch, Eddlestone	1872 Middleton, James, Commission Agent, Aberdeen
1856 MELVILLE, Lieut.-Gen. the Right. Hon. Viscount, K.C.B., Melville Castle, Lasswade	1863 Middleton, John, Kinfauns Castle, Perth
1819 Melville, J. W., of Bennoch, Mount Melville, St Andrews	1872 Middleton, Jonathan, Davidston, Invergordon
1862 Melvin, Charles, Penston, Tranent	1872 Middleton, Jonathan, Fearn, Tain
1849 Melvin, James, Bonnington, Wilkieston	1875 Middleton, Thomas, Farness, Invergordon
1839 MENZIES, Hon. Lady, of Menzies, Rannoch Lodge, Pitlochry	1858 Middleton, William, Bridgefoot, Monymusk
1872 Menzies, Alexr., Auchengaven, Luss	1873 Mill, Allan, Dods, Lauder
1863 Menzies, Duncan, C.E., 13 Young Street, Edinburgh	1853 Millar, C. H., Merchant, Montrose
1864 Menzies, Duncan, 14 Ness Bank, Inverness	1870 Millar, James, of Priestlands, Dumfries
1841 Menzies, Fletcher Norton, Edinburgh — <i>Secretary of the Society</i>	1852 Millar, James Lawson, Waukmill, Dunfermline
1853 Menzies, Graham, London	1864 Millar, James, Mills of Torr, Blair Drummond
1857 Menzies, James, Auchengavin, Luss	1853 Millar, Thos., Briggs, Cramond Bridge
1869 Menzies, James, of Pitnacree, M.D., Ballinluig	1854 Millar, Thomas, of Balliliesk, Dollar
1874 Menzies, John, Caledonian Hotel, Inverness	1843 Miller, Captain Alexander Penroso
1870 Menzies, John, Inch Farm, Kincardine-on-Forth	1873 Miller, Colin W., Wellwood, Bridge of Allan
1849 Menzies, J. A. Robertson, New Zealand	1868 Miller, G. J., of Frankfield, Glasgow
1841 MENZIES, Sir Robert, of Menzies, Bart., Farleyer, Aberfeldy	1861 Miller, George, St Magdalenes, Perth
1871 Menzies, Robert, S.S.C., 5 North St David Street, Edinburgh	1853 Miller, Hew, Ochertyre, Crieff
1865 Menzies, William, Achnacarron, Inveraray	1847 Miller, John, of Leithen, Edinburgh
1870 Menzies, William J., W.S., 22 Hill Street, Edinburgh	1861 Miller, John, Doune, Thurso
1861 Mercer, Daniel, Achamore, Dunoon	1874 Miller, John, Seafield, Cullen
1850 Mercer, Græme R., of Gorthy, Glen Tulchan, Perth	1843 Miller, O. G., Dundee
1861 Mercer, John, Ardenadam, Dunoon	1873 Miller, Thomas, of Myers, St Ninians
1863 Mercer, R., of Scotsbank, Ramsay Lodge, Portobello	1864 MILLER, Sir William, of Manderston, Bart., Dunse
1870 Merricks, H. J., Gunpowder Mills, Roslin	1871 Miller, William, Over Kinfauns, Perth
1870 Merricks, J. L., Gunpowder Mills, Roslin	1870 Millie, George, Kilmaron, Cupar-Fife
1870 Merricks, William, Gunpowder Mills, Roslin	1855 Milligan, James, Hayfield, Thornhill
1872 Merrilees, Robert, 51 Argyll Street, Glasgow	1870 Milligan, John, Merikland, Dunstons
1838 Merry, J., of Belladrum, Beaully	1857 Mills, George, Greenend, St Boswells
1865 Methven, Thomas, Nurseryman, Edin.	1859 Mills, G., late Horsburgh Castle, Peebles
1873 Michael, James, 3 Caledonian Place, Edinburgh	1858 Milne, A., Corse of Kinnaird, Huntly
1867 Michie, C. Y., Cullen House, Cullen	1855 Milne, Alex., Mill of Allathan, Udnay
1865 MIDDLETON, Right. Hon. Lord, Birdsall House, York	1856 Milne, J., Netherton of Pittendrum, Fraserburgh
1875 Middleton, A. A., Rosefarm, Cromarty	1856 Milne, J., Union Bank of Scotland, Elgin
1840 Middleton, C. S., Merchant, Liverpool	1857 Milne, James, Balnagubs, Stonehaven
1864 Middleton, George, Corneton, Dingwall	1859 Milne, James (late Meinfoot, Ecclefechan), America
	1862 Milne, James, Banker, Huntly
	1867 Milne, John, Mains of Laithers, Turriff — <i>Free Life Member 1873</i>
	1841 Milne, Nicol, of Faldonside, Melrose
	1863 Milne, Nicol, Dryhope, Selkirk
	1861 Milne, Peter, 19 Buccleuch Place, Edinburgh
	1866 Milne, W., Tillicycairn, Cluny, Aberdeen
	1863 Minto, Right Hon. the Earl of, Minto House, Hawick
	1870 Minto, John D., Dumfries
	1851 Mitchell, Alex., of Sauchie, Maybole

Admitted

- 1857 Mitchell, Alex., Devon House, Alloa  
 1870 Mitchell, Alex., Implement Maker, Peterhead  
 1848 Mitchell, Andrew, Alloa  
 1874 Mitchell, Andrew, Drumderfit, Munchloch  
 1875 Mitchell, Andrew, Ratagan House, Glenshiel, Inverness  
 1861 Mitchell, David, Burnton, Laurencekirk  
 1874 Mitchell, James R., Drynie, Inverness  
 1857 Mitchell, Duncan, late Blairvockie, Luss  
 1848 Mitchell, H., of Polmood, Bangholm Bower, Edinburgh  
 1857 Mitchell, Hugh, High Lossit, Campbeltown  
 1851 Mitchell, James, Dologan, Pentre Brunant, Aberystwith  
 1857 Mitchell, J., Iloneston, Campbeltown  
 1864 Mitchell, James, Banker, Pitlochry  
 1850 Mitchell, J., Ballemenach, Campbeltown  
 1873 Mitchell, John, jun., Barcheskie, Rerrick, Kirkcubright  
 1861 Mitchell, John, Flisk Milln, Cupar-Fife  
 1862 Mitchell, J., Lordscairnie, Cupar-Fife  
 1864 Mitchell, John, Provost of Dingwall  
 1872 Mitchell, John, Knockhouse, Dunfermline  
 1836 Mitchell, J., Civil Engineer, Inverness  
 1873 Mitchell, John Forbes, of Thainston, Kintore  
 1870 Mitchell, Joseph M., Burnscaith Green, Dumfries  
 1859 Mitchell, Robert, Brewer, Cupar-Fife  
 1850 Mitchell, S., Dalivaddy, Campbeltown  
 1874 Mitchell, William, Cussochie, Methven, Perth  
 1862 Mitchell, Wm., Merchant, Montrose  
 1869 Mitchell, Wm., S.S.C., Edinburgh  
 1863 Mitchell, Wm., Pulrossie, Dornoch, Sutherland  
 1868 Mitchell, Wm. A., Auchnagathel, Keig, Aberdeen  
 1849 Mitchell, W. G., of Carwood, Biggar  
 1874 Mitchell, Wm. G., Auchindarroch, Ballachulish  
 1832 Mitchelson, Archibald Hepburne, Pitlochry  
 1861 Moffat, George, 6 Brown Street, Glasgow  
 1850 Moffat, James, Garwald, Langholm  
 1860 Moffat, James, Gateside, Kirkconnell, Sanquhar  
 1867 Moffat, James, of Kenervie, British Linen Bank, Castle Douglas

Admitted

- 1869 Moffat, James, Kirkclinton Park, Kirkclinton, Carlisle  
 1850 Moffat, John, Craick, Hawick  
 1873 Moffat, R. Carter, Professor of Chemistry, Veterinary College, Glasgow  
 1862 Moffat, Thomas, Drumbuie, Sanquhar  
 1864 Moffat, Wm., Chatsworth, Victoria  
 1871 Moir, James, Banker, Alloa  
 1873 Moir, James, jun., Alloa  
 1858 Moir, James, Mains of Wardhouse, Inch  
 1873 Moir, James M<sup>c</sup>Arthur, of Hillfoot, Dollar  
 1873 Mollison, James, Factor, Dochgarroch Lodge, Inverness  
 1842 Moncrieff, Alexander, W.S., Perth  
 1852 Moncrieff, Major Alexander, of Barnhill, Perth  
 1866 Moncrieff, David Scott, W.S., Edinburgh  
 1848 MONCRIEFF, Right Hon. Lord, of Tulibole, Lord Justice-Clerk  
 1843 MONCRIEFF, Sir Thomas, of Moncrieffe, Bart., Bridge of Earn  
 1833 Monro, A. B., of Auchinbowie, Stirling  
 1851 Monro, David, of Allan, Tain  
 1846 Monteith, B., Tower Mains, Liberton  
 1866 Monteith, D., Belleville Lodge, Blacket Place, Newington, Edinburgh  
 1837 Monteith, Robert, of Carstairs  
 1870 Montgomery, And., Boreland, Castle-Douglas  
 1843 MONTGOMERY, Sir G. Graham, of Stanhope, Bart., M.P., Stobo Castle, Stobo  
 1846 Montgomery, John H., of Newton, Stobo Castle, Stobo  
 1871 Montgomery, Thomas H., of Hattonburn, Milnathort  
 1878 Montgomery, Wm., jun., Stuck, Row  
 1839 Moore, John C., of Corsewall, Stranraer  
 1852 Moray, C. Home Drummond, of Abercainy, Crieff  
 1869 Moray, H. D., yr. of Abercainy, Crieff  
 1868 Morgan, David, South Mains of Ethie, Arbroath  
 1861 Morison, James, Rossie, Dunning  
 1850 Morison, James G., Glasgow  
 1862 Morison, J. B. B., of Findorley, Kinross  
 1871 Morris, William, V.S., 7 Langstan Place, Aberdeen  
 1855 Morrison, Charles, of Islay, Bridgend, Islay  
 1873 Morrison, George, Seedsman, Elgin  
 1858 Morrison, Harry L. L., of Blair, East Grange, Forres  
 1850 Morrison, James, Glasgow  
 1873 Morrison, James M., Banker, Stirling  
 1859 Morrison, John, West Dalmeny, South Queensferry  
 1861 Morrison, William, Cairnie, Forteviot

Admitted	Admitted
1872 Mortimer, Thos. A., 86 George Street, Edinburgh	1870 Munro, William, Kenmore, Aberfeldy
1846 MORRISON, Right Hon. the Earl of, Dalmahoy, Ratho	1864 Murdoch, James, Carnlyne, Shettleston
1869 Morton, Andrew, Bickerton Hall, Whitburn	1874 Murdoch, James F., Hallside, Cambuslang
1835 Morton, H., Belvidere House, Trinity	1853 Murdoch, John Burn, of Gartincaber, Advocate, Greenhill Lodge, Edin.
1861 Morton, J., Lambieletham, St Andrews	1875 Murdoch, John, Carnlyne, Shettleston
1861 Morton, John, North Muirton, Perth	1857 Murdoch, Robert, Hallside, Cambuslang
1859 Mossman, H., of Auchtyfardle, Lanark	1856 Murdoch, William, Solicitor, Huntly
1864 Mossman, Adam, Blacket Place, Edinburgh	1847 MURE, Hon. Lord, 12 Ainslie Place
1843 Moubray, John M., late of Hartwood	1874 Mure, James, Editor of <i>Courant</i> , Edinburgh
1862 Moubray, Robert, Cambus Distillery, Stirling	1861 Mure, Lieut.-Col. William, M.P., of Caldwell, Bath
1865 Mounsey, J. T., of Kingfield, Longtown, Cumberland	1870 Mure, William J., Advocate, 12 Ainslie Place, Edinburgh
1867 Muckart, James, Land Steward, Barns Cottage, Maybole	1846 Murray, Andrew, of Conland, 67 Bedford Gardens, Kensington, London
1840 Mudie, John, of Pitmuies, Forfar	1828 Murray, Anth., of Dolerie, W.S., Edinburgh
1873 Muir, Andrew Lees, Coal Merchant, Stirling	1871 Murray, C. A., Taymount, Stanley
1852 Muir, G. W., Kirkhouse, Traquair, Innerleithen	1864 Murray, D., 31 Queen Street, Edin.
1864 Muir, James, Hardington Mains, Wiston, Biggar	1871 Murray, David, Dunia, Crieff
1843 Muir, John, late of Gartferrie	1871 Murray, David, Banker, Meikle
1863 Muir, W. H., S.S.C., Edinburgh	1860 Murray, Rev. George, of Torquhain, Balmacellan Manse, New Galloway
1862 Muirhead, E. W., The Hill, Putney, Surrey	1854 Murray, George, New Zealand
1872 Muirhead, F., Eaglescarnie Mains, Haddington	1865 Murray, G. R., Chapelrossan, Stranraer
1863 Muirhead, George, Durdie, Errol	1867 Murray, G., Elvaston Castle, Derby
1872 Muirhead, Geo., Paxton, Berwick-on-Tweed	1869 Murray, G. W., Banff Foundry, Banff
1865 Muirhead, J. J., Princes Street, Edin.	1874 Murray, Henry, 14 Argyle Place, Edinburgh
1865 Muirhead, John, Salton Mains, Tranent	1843 Murray, Jack H., Captain R.N., Easthaugh, Pitlochry
1867 Muirhead, Robert, Chesterhall, Biggar	1850 Murray, James, East Barns, Dunbar
1873 Muirhead, William, Pirnhall, Bannockburn	1957 Murray, James, Dumfries Arms Hotel, Old Cumnock
1873 Munby, Edward Chas., Myton Grange, Helperly, Yorkshire— <i>Free Life Member</i>	1873 Murray, James, of Gartur, Stirling
1858 Mundell, D., Gollanfield, Fort George Station	1861 Murray, James, Cutter House, Drymen
1874 Mundell, John, Scallisaig, Glenelg	1869 Murray, James Wolfe, of Cringlotie, Peebles
1870 Mundell, Walter Grieve, Inverlaur, Dingwall	1846 MURRAY, Sir John, of Philiphlaugh, Bart., Selkirk
1864 Munro, A., Ballintraid, Invergordon	1862 Murray, John L., of Heavyside, Biggar
1874 Munro, Alexr., Ord, Invergordon	1863 Murray, Lieut.-Col. John, of Polmaise, Stirling
1874 Munro, A. P. C., of Rockfield, Fearn	1863 Murray, Dr John, Kersknowe, Kelso
1874 Munro, Chas., Cattle Salesman, Inverness	1873 Murray, John, Munnieston, Thornhill, Stirling
1857 Munro, Donald, Chamberlain of the Lews, Stornoway	1863 Murray, John, of Woodplaw, Galashiels
1864 Munro, D., Contin, Dingwall	1820 Murray, Joseph, of Ayton
1853 Munro, John, Fairnington, Kelso	1851 Murray, Kenneth, of Geanies, Tain
1874 Munro, John, Seedsman, Inverness	1862 MURRAY, Sir Patrick Keith, of Ochertyre, Bart., Crieff
1874 Munro, Henry, Corn Merchant, Inverness	1850 Murray, Robert, 64 Grove St., Edin.
1870 Munro, Robert, Covesea, Duffus, Elgin	1858 Murray, R., 7 Roxburgh Place, Edin.
	1874 Murray, Robert G., of Spittal, Biggar
	1857 Murray, Thomas, Eastside, Penicuik
	1852 Murray, Thomas G., W.S., 11 Randolph Crescent, Edinburgh



Admitted

- 1869 Murray, Wm., Calderhead, Shotts  
1866 Murray, William, Kilcoy, Kilearnan,  
Ross-shire  
1858 Murray, Wm., Mains of Pittendreich,  
Turriff  
1859 Murrie, John, Banker, Stirling  
1859 Mustard, Alex., Leuchland, Brechin  
1857 Mutter, J., Wester Melville, Lasswade  
1858 Myers, Geo. C., Town-Clerk, Montrose  
1864 Myles, James, Deanside, Renfrew  
1860 Mylne, Thos., Niddrie Mains, Liberton

- 1874 Nairne, William, of Dunsinnane, Perth  
1843 NAPIER and ETTRICK, Right Hon.  
Lord, K.T.

- 1863 NAPIER, Hon. William  
1848 NAPIER, Sir R. J. M., of Milliken, Bart.,  
Johnstone, Renfrewshire  
1857 Napier, Dugald, Australia  
1840 Napier, George, Advocate, Sheriff of  
Peeblesshire  
1844 Napier, R., of Shandon, Helensburgh  
1872 Nares, A. F., Brucktor, Bourtie, Aber-  
deen

- 1846 NEAVES, Hon. Lord, 7 Charlotte Sq.  
1870 Neilson, Joseph, Killimington, Kirk-  
gunzeon, Dumfries

- 1867 Neilson, William, Estate Factor and  
Banker, Bank of Scotland, Bellshill  
1871 Nelson, Charles, Skateraw, Dunbar  
1859 Nelson, Michael, Hill of Drip, Stirling  
1865 NEPEAN, Sir M. H., of Loders Court,  
Bart., Bridport

- 1845 Newall, John, Mexico  
1838 Newton, Jas. E., of Linnbank, Lanark  
1865 Newton, Captain Hay, of Newton,  
Haddington

- 1837 Newton, Robert P., of Castlandhill,  
Polmont Bank, Falkirk

- 1872 Newton, T. H. G., Barrels Park, Hen-  
ley-in-Arden

- 1861 Nicholson, Robert, Glencaple, Dumfries  
1867 Nicol, Alex., 39 Marischal Street,  
Aberdeen

- 1869 Nicol, W. E., of Ballogie, Banchory

- 1844 Nicoll, Alexander, late of Edinburgh

- 1867 Nicoll, T. Munro, Littleton, Kirriemuir

- 1819 Nicolson, Major Allan M., of Ardmure

- 1857 Nicolson, J. Badenach, yr. of Gloubervie,  
Fordoun

- 1857 Nicolson, Neil, Corra, Ardlamont,  
Greenock

- 1843 Nielson, A., Bank of Scotland, Glasgow

- 1873 Nimmo, Alex., of West Bank, Falkirk

- 1852 Nimmo, Matt., Foot of Green, Stirling

- 1870 Nisbet, Jas., Lambden, Greenlaw, Dunse

- 1854 Nisbet, John, Rumbleton, Greenlaw,  
Dunse

- 1875 Nisbet, John, Longgreen, Loudoun,  
Kilmarnock

Admitted

- 1865 Nisbet, Ralph P., Estate Office, Thor-  
ney, Peterborough

- 1847 Nisbett, J. M., of Cairnhill, Drum,  
Edinburgh

- 1860 Niven, Alexander T., C.A., Edinburgh

- 1873 Nivison, Stewart, Lairdlaugh, Dal-  
beattie

- 1862 Norie, Henry Hay, W.S., Perth

- 1860 Norman, William, Hall Bank, Aspatria  
—Free Life Member 1873

- 1867 Norris, Pet., Todholes, Fintry, Stirling

- 1843 NORTHESK, Right Hon. the Earl of,  
Ethie House, Arbroath.

- 1868 OCHTERLONY, Sir Charles Metcalfe, of  
Ochterlony, Bart., St Andrews

- 1859 Odams, James, London

- 1873 Ogilvie, A. M., Tillynaught, Portsoy

- 1854 Ogilvie, Archibald, Old Liston, Ratho

- 1820 Ogilvie, Captain William, R.N.

- 1809 Ogilvie, Wm., of Chesters, Jedburgh

- 1853 Ogilvie, William R., Askrigg Hall,  
Skelton, Penrith

- 1860 Ogilvie, George, Holefield, Kelso

- 1868 Ogilvy, Donald, of Clova, Balnaboth,  
Kirriemuir

- 1870 Ogilvy, Col. James W., Rannagulzion,  
Blairgowrie

- 1824 OGILVY, Sir John, of Inverquharly,  
Bart., M.P., Baldovan House, Dundee

- 1836 Ogilvy, John, of Inshewan, 9 Cham-  
berlain Road, Edinburgh

- 1859 Ogilvy, John, Harecraig, Dundee

- 1874 Ogilvy, John Francis, yr. of Corri-  
mony, Glen Urquhart

- 1871 Ogilvy, Reginald Howard Alexander, yr.  
of Inverquharly, Millhill, Inchtute

- 1844 Ogilvy, Lt.-Col. Thomas W., of Ruth-  
ven, Meigle

- 1838 Ogilvy, Thos., of Corrimony, Inverness

- 1872 Oliphant, L. J., of Condie, Guards'  
Club, London

- 1873 Oliphant, Thomas, of Rossie, Bridge  
of Earn

- 1850 Oliver, James, Howpasley, Hawick

- 1852 Oliver, James, of Thornwood, Hawick

- 1853 Oliver, Robert, of Blakelaw, Lochside,  
Kelso

- 1856 Oliver, Thos., Redheughs, Corstorphine

- 1858 Oliver, W. Elliot, Tinnis, Selkirk

- 1873 Oliver, Wm. M., Howpasley, Hawick

- 1867 ORANMORE and BROWN, Right Hon.  
Lord, Castle Macgarrett, Mayo

- 1873 Orr, James, Hill, Whitburn

- 1873 Orr, Thomas, Limerigg, Slamannan,  
Falkirk

- 1841 Ord, John, of Muirhouselaw, Nisbet,  
Kelso

- 1830 ORDE, Sir J. P., of Kilmory, Bart.,  
Lochgilthead

## Admitted

- 1858 Orde, Captain John W. Powlett, yr. of  
Kilmory, Auchnaba, Lochgilphead  
1854 ORMDALE, Hon. Lord. 14 Moray  
Place  
1848 Ormiston, William T, of Glenburn  
Hall, Jedburgh  
1848 Oswald, James Townsend, of Dunn-  
kier, Kirkealdy  
1870 Oswald, Richard A., of Auchincruive,  
Ayr  
1863 Otto, Wm. E., Jedneuck, Jedburgh  
1872 Outhwaite, John, Bainesse, Catterick  
  
1852 Pagan, A. C., Rockclyffe, Crief  
1872 Panton, Patrick, of Edenbank, Kelso  
1871 Panton, Jn., of Dalnagairn and Carsie,  
Blairgowrie  
1873 Panton, Wm., Maryfield, Blairgowrie  
1874 Park, Ebenezer, Engineer, Greenside  
Lane, Edinburgh  
1863 Park, James, Stoneyhill, Musselburgh  
1873 Park, James D., Engineer, Greenside  
Lane, Edinburgh—Practical Engineer  
to the Society  
1874 Park, John, Merchant, Leith  
1866 Park, Thomas B., Springfield, Had-  
dington  
1874 Park, William, Gallowhill, Paisley  
1857 Parker, J., Nether Broomlands, Irvine  
1867 Parnell, Dr Richard, Gattonside, Mel-  
rose  
1858 Paterson, Alexander, Mulben, Keith  
1860 Paterson, Alex., Carmacoup, Douglas  
1867 Paterson, Charles, Canford Manor,  
Wimborne  
1864 Paterson, D. A., Merchant, Leith  
1870 Paterson, Dav. J., Watch Hall, Annan  
1872 Paterson, Jas., of Kinnettles, Dundee  
1872 Paterson, James, Townhead, Kippen  
1853 Paterson, Jas., Whitehouse, Lamlash  
1860 Paterson, James, of Longbedholm,  
Moffat  
1862 Paterson James, Chapelhill, Hawick  
1847 Paterson, John, jun., late Kilconan,  
Campbeltown  
1852 Paterson, John, Macoriston, Thornhill,  
Stirling  
1857 Paterson, John, Skirling Mains, Biggar  
1860 Paterson, John, Eastfield, Penicuik  
1862 Paterson, John, Howleuch, Moffat  
1870 Paterson, John, Wood of Kirkmichael,  
Dumfries  
1873 Paterson, John Thomas Scott, Plean  
Farm, Bannockburn  
1871 Paterson, Peter Hay, Mugdrum, New-  
burgh  
1854 Paterson, J. W., Terrona, Langholm  
1848 Paterson, Robert, of Birthwood, Biggar  
1869 Paterson, Thomas, W.S., Edinburgh  
1851 Paterson, Walter, Merchant, Glasgow

## Admitted

- 1851 Paterson, Wm., Twigloes, Lockerbie  
1870 Paterson, William, of Brucklehirst  
Mounswald, Dumfries  
1863 Paterson, W., of Eltrickhall, Galashiels  
1874 Paterson, Wm. Grindlay, Scotsburn,  
Invergordon  
1865 Paterson, Wm. Innes, Armadale,  
Thurso  
1873 Paterson, William, Auldtown of Car-  
nousie, Turriff  
1857 Paton, Alex., Norwood, Sydenham,  
London  
1864 Paton, D., Woodburn, Harrietfield,  
Porth  
1873 Paton, Jas., jun., of Viewforth, Stirling  
1873 Paton, Jn., of Westbourne, Tilli-  
coultry  
1859 Paton, John, Standingstone, Had-  
dington  
1833 Paton, John, of Crailing, Kelso  
1841 Paton, John, of Grandholm, Aberdeen  
1873 Paton, Robert, West Drip, Stirling  
1865 Patrick, James, late of Kilmun, Argyll-  
shire  
1873 Patrick, James, Queenzieburn, Kilsyth  
1850 Patterson, John, Balliemore, Strachur  
1851 Patterson, Robert, Cardross, Stirling  
1869 Pattinson, William Thom, Baldwin  
Holme, Carlisle  
1864 Pattison, A. D., of Dalmuir, Glasgow  
1869 Pattison, George H., Advocate, Sheriff  
of Roxburgh, Berwick, and Selkirk  
1872 Pattison, J. P., of the Haining, Melrose  
1861 Pattullo, G., Coupar Grange, Coupar-  
Angus  
1861 Pattullo, Peter, Eassie Farm, Meikle  
1855 Paul, William, Advocate, Aberdeen  
1854 Pearson, Andrew A., of Springfield,  
Carluko  
1863 Pearson, David A., Johnston Lodge,  
Laurencekirk  
1858 Peat, John, Manor, Stirling  
1872 Peddie, John Dick, Architect, Edin-  
burgh  
1874 Pegler, Thos. B., Ironworks, Inverness  
1867 Peila, H. R. B., Mansion House,  
Greenock  
1864 Pelham, C. Thursby, Waen, Abergele,  
North Wales  
1871 Pender, Chas. P., Invervar Lodge,  
Aberfeldy  
1857 Pender, George (late Dumbreck, Kil-  
syth), Australia  
1869 Pender, Capt. James, Mount Street,  
Manchester  
1865 Pender, John Menzies, Auchindall,  
Fort-William  
1869 Pender, J., M.P., Manchester  
1869 Pender, J., Springhill, Stane, Mother-  
well

# *Highland and Agricultural Society, 1875.*

## Admitted

- 1868 Penman, John, Bonally, Colinton  
 1869 Penny, Thomas, Bartlehill, Coldstream  
 1873 Pennycook, William, Wester Logie, Dunkeld  
 1854 Peter, Charles, Canterland, Montrose  
 1854 Peter, John, Croyard, Beaully  
 1862 Potor, John, of Over Possil, Glasgow  
 1875 Peterkin, Jas. Grant, of Grange, Forres  
 1871 Petrie, George, Easter Suddie, Avoch  
 1868 Petrie, James, Banker, Duftown  
 1871 Petrie, Stephen F., 350 Leith Walk, Edinburgh  
 1870 Petrie, William, Kirkhill, Elgin  
 1875 Pettigrew, James, Cliftonhill House, Coathridge  
 1856 Philip, George, Boynds, Keith Hall, Inverurie  
 1851 Philip, John, Polton East Mains, Lasswade  
 1858 Philip, W., Lofthillock, Keith Hall, Inverurie  
 1860 Philips, Hugh, Cracrop, Stapleton, Carlisle  
 1854 Phillips, John, Laighpark, Milngavie  
 1864 Philip, Robert, Royal Hotel, Bridge of Allan  
 1868 Phin, John, S.S.C., Edinburgh  
 1857 Pickon, James, Laigh Langside, Craigie, Kilmarnock  
 1857 Pickon, Captain Jas. H., of Hillhouse, Lodge, Fenwick  
 1857 Pickon, John, Mansfield Mains, New Cumnock  
 1860 Picken, R., Barnkirk, Newton-Stewart  
 1855 Pirie, James, Waterton, Ellon  
 1868 Pirie, T., Kinmundy, Longside, Aberdeen  
 1871 Pirrie, Jas. P., Coachbuilder, Perth  
 1873 Pitblado, Charles B., Colton Mains, Dunformline  
 1841 Pitcairn, John, of Pitcullo, Cupar-Fife  
 1863 Pitcairn, John, 22 Queen Street, St Andrews  
 1859 Pitman, Frederick, W.S., Edinburgh  
 1859 Pittendrigh, A., Mains of Park, Lomnay  
 1857 Pittendrigh, J., Bodychell, Fraserburgh  
 1871 Playfair, George G., Errol Villa, Lee, Kent  
 1859 Plenderleith, A., Moorfoot, Gorebridge  
 1842 Plummer, Charles Scott, of Sunderland Hall, Selkirk  
 1850 Plummer, G. Hay, Dalkeith  
 1860 Plummer, J., 11 Brantsfield Place, Edinburgh  
 1811 Pollexfen, James R., of Cairston, W.S., Edinburgh

## Admitted

- 1844 Pollok, Allan, of Faside, Newton. Mearns  
 1873 Pollok, John, of Blackhouse, Mearns  
 1863 POLWARTH, Right Hon. Lord, Mertoun House, St Boswells  
 1867 Pople, H. W., British Hotel, Perth  
 1861 Pople, J. B., of Newhouse, Perth  
 1870 Porteous, John, Whim, Leadbun  
 1855 Porter, James, Factor, Monymusk, Aberdeen  
 1854 Pott, Gideon, of Knowsouth, Jedburgh  
 1867 Potter, James, of Glenfuir, Falkirk  
 1863 Potts, Andrew, Lewinshope, Selkirk  
 1861 Powrie, Archibald, Lairwell, Perth  
 1849 Powrie, James, of Reswallie, Forfar  
 1871 Prain, Henry, Mains, of Castle Huntly, Longforgan  
 1864 Prentice, George, of Strathore, Newbigging, Burntisland  
 1865 Prentice, R. R., Skeddoway, Kirkcaldy  
 1875 Preston, W. E., Moy, Beaully  
 1873 Pretsell, James, Drummelzier Place, Rachen Mill, Biggar  
 1873 Pretsell, John, Drava, Biggar  
 1863 Primrose, James Thomson, Sauchland, Ford  
 1875 Pringle, Adam T., 6 India Buildings, Edinburgh  
 1859 Pringle, Alexander, of Whytbank, Selkirk  
 1863 Pringle, David, of Wilton Lodge, Hawick  
 1863 Pringle, David, Hyndlee, Bonchester Bridge  
 1863 Pringle, James Thomas, of Torwoodlee, Galashiels  
 1865 Pringle, John, Garvald, Gorebridge  
 1852 Pringle, Robert K., The Grove, Darley Dale, Matlock  
 1868 Profett, Dr, Nether Towie, Inverkindie, Aberdeen  
 1868 Proudfoot, T., Pinkiehill, Musselburgh  
 1870 Pullar, John, Perth  
 1864 Pullar, John, jun., Keirfield, Bridge of Allan  
 1871 Pullar, Robert, Perth  
 1871 Pullar, William, Kingussie  
 1865 Puntton, F. H., West Fortune, Drem  
 1867 Purdie, Geo., Muirhouse, Carnwath  
 1872 Purdom, Walter, East Wooden, Eckford, Kelso  
 1861 Purves, James, Lochend, Thurso  
 1871 Purves, Thomas, Rhifail, Bettyhill, Thurso  
 1859 Purves, William, Burnfoot, Morebattle, Kelso  
 1869 Purves, William, Thurdistoft, Thurso  
 1844 Purvis, John, of Kinaldy, St Andrews

Admitted	Admitted
1869 QUEENSBERRY, Most Noble the Marquis of, Kinmount, Annan	1858 Reid, George, Seedsman, Aberdeen
1872 Rae, Robt., Whiterighill, St Boswells	1874 Reid, George, Baads of Drum, Peterculter, Aberdeen
1860 Rae, William, Gateslack, Thornhill	1871 Reid, George, of Tilliery, Milnathort
1870 Rain, William, Kempleton, Castle Douglas	1855 Reid, James, Ballencrieff, Drem
1867 Raines, Thos., Bridgehaugh, Stirling	1872 Reid, Dr J. B., Aberfeldy
1838 Rait, D. C., Goldsmith, Glasgow	1857 Reid, J., Corsebank, Sanquhar
1854 Rait, James, of Anniston, Arbroath	1873 Reid, James, Kilmundie, Glamis
1867 Ralston, Andrew, Lagg, Ayr	1867 Reid, James R., Woodburn, Rutherglen
1868 Ralston, Andrew, Glamis, Forfar	1875 Reid, James, Inchberry, Inverness
1870 Ralston, A. R., Genoch, Straiton, Maybole	1869 Reid, J., Sanquhar, Gartly, Huntly
1871 Ralston, James J., Old Faskally, Pitlochry	1859 Reid, John, Ingric, Leslie
1871 RAMSAY, Sir James Henry, of Bamff, Bart., Alyth	1870 Reid, John James, Advocate, 6 India Street, Edinburgh
1856 Ramsay, John, of Kildalton, M.P., Port Ellen, Greenock	1850 Reid, Walter, Drom
1875 Ramsay, John, Butcher, Kilbarchan	1864 Reid, Walter, Craigarnhall, Bridge of Allan
1856 Ramsay, Col. John, of Barra, Straloch, Aberdeen	1871 Reid, William, Pittentian, Crieff
1841 Ramsay, Robert B. Wardlaw, of Whitehill, Lasswade	1871 Reith, James, South Auchincleach, Skene, Aberdeen
1837 Ranken, George, Australia	1872 Renwick, John, Nurseryman, Melrose
1874 Ranken, John, Ballencrieff Mains, Haddington.	1873 Renny, Thomas, of Dundarroch, Pitlochry
1838 Ranken, Thomas, S.S.C., Edinburgh	1859 Reoch, J. F., 39 Inverleith Row, Edinburgh
1866 Rankin, George, Union Bank, Aberfeldy	1873 Richardson, Alex., Castleton, Gorebridge
1874 Rankine, John, of Bassendean, 6 India Street, Edinburgh	1863 Richardson, D., of Hartfield, Glasgow
1857 Rankine, John, of Beoch, Lochlands, Maybole	1874 Richardson, George, 89 Wilson Street, Glasgow
1868 Rankine, R. W., Rosebank, Falkirk	1861 Richardson, Captain James T. Stewart, yr. of Pitfour, Perth
1859 Rannie, M. G., Edenmouth, Kelso	1823 RICHARDSON, Sir John S., of Pitfour, Bart., Perth
1868 Rate, George, Mungoswells, Drem	1873 Richardson, John, Brunton Place, Carlisle
1854 Rattray, Col. J. C., of Craighall, Blairgowrie	1851 Richardson, John, Writer, Haddington
1874 Rattray, James Clark, M.D., of Coral Bank, Blairgowrie	1863 Richardson, J., Mainshill, Haddington
1856 Rawdin, Joseph, Chemist, Jedburgh	1837 Richardson, Robert, 16 Bruntsfield Place, Edinburgh
1870 Rawline, J. D., Raglan Castle, Raglan	1863 Richardson, R., Craillingnook, Jedburgh
1854 Ray, William, Sunbank, Elgin	1840 RICHMOND and LENNOX, His Grace the Duke of K.G., Gordon Castle, Fochabers
1863 Rea, Charles, Doddington, Wooler	1861 Richmond, G., of Balhaldie, Lawhill, Auchterarder
1872 Rea, Geo., Middleton House, Alnwick	1861 Richmond, John, Dron, Bridge of Earn
1874 Reddie, Captain John Griffiths, of Redhouse, Rickarton House, Stonehaven	1871 Richmond, T., Hilton, Perth
1857 Redfern, W. Macquarrie, London	1831 Rickman, Thomas, late Architect, Birmingham
1864 Reekie, A., Walton, Auchtertool, Kirkcaldy	1863 Riddell, David, Kilbowie, Duntocher
1872 Reekie, Wm., Carterhaugh, Selkirk	1854 Riddell, Thomas, of Menslaws, Jedburgh
1857 Reid, Alexander, Cruivie, Cupar	1845 RIDDELL, Sir T. M., of Sunart, Bart., Strontian
1873 Reid, Alexander, Architect, Elgin	1852 Riddell, William, Hundalee, Jedburgh
1844 Reid, Charles G., W.S.	
1871 Reid, Duncan, Migvie, Tarland	
1867 Reid, F. R., of Gallowflat, Rutherglen	

Admitted

- 1863 Riddell, William, Howford, Peebles  
 1861 Rigg, Wm., Banks, Kirkcudbright  
 1871 Rintoul, Alexander, Ardno, Cairndow  
 1852 Rintoul, Charles, Kingston, North Berwick  
 1861 Rintoul, D., Mains of Blebo, Cupar-Fife  
 1872 Rintoul, Lawrence, Merchant, Perth  
 1865 Rintoul, Robert, of Lahill, Largo  
 1878 Risk, Robert, Drumbrae, Bridge of Allan  
 1869 Ritchie, Charles, S.S.C., Edinburgh  
 1865 Ritchie, Charles, late Ladoga Lodge, Musselburgh  
 1863 Ritchie, James, 140 High Street, Edinburgh  
 1857 Ritchie, John, Newbigging Mains, Carnwath  
 1867 Ritchie, John, Whitecastle, Biggar  
 1872 Ritchie, Robert, Cloverhill, Biggar  
 1853 Ritchie, W., Spott, Dunbar  
 1852 Ritchie, Wm., Plean Mill, Stirling  
 1865 Ritchie, W., of Middleton, Gorebridge  
 1849 Robb, James, Gorgie, Murrayfield  
 1863 Robertson, And., Hoselawbank, Kelso  
 1841 Robertson, James, Kelso  
 1854 Robertson, John, Hoselaw, Kelso  
 1863 Robertson, John, jun., Harperton, Kelso  
 1863 Robertson, Robert, Ladyrig, Kelso  
 1873 Roberts, James, Lumbair, Stonehaven  
 1871 Robertson, Mrs., sen., of Struan, Pitlochry  
 1871 Robertson, Alex., West Inchmichael, Errol  
 1856 Robertson, A. F., Ardlaw, Fraserburgh  
 1839 Robertson, Alexander Inglis, Aultnas-kiach, Inverness  
 1869 Robertson, Rev. A. Irvine (of Kindrochot), Aberdeen  
 1832 Robertson, Andrew, M.D., of Hopewell, Indego, Tarland  
 1840 Robertson, Arthur John, Culcabock House, Inverness  
 1860 Robertson, Dr Charles, Auchtercairn, Gairloch  
 1869 Robertson, C., of Kindeace, Invergordon  
 1874 Robertson, W. D. A., yr. of Kinlochmoidart, Fort William  
 1861 Robertson, David, Cloag, Methven Perth  
 1847 Robertson, David Souter, of Whitehill, Cookston Park, Brechin  
 1854 Robertson, Donald, of Pencross, Edinburgh  
 1864 Robertson, D. G., of Torrie, Callander  
 1871 Robertson, D. A. C., North Dowald, Abercairny, Crieff  
 1860 Robertson, George B., Berwick-on-Tweed

Admitted

- 1874 Robertson, James, Borenich, Pitlochry  
 1886 Robertson, James, 27 Albert Place, Stirling  
 1859 Robertson, J., Denbrae, Cupar-Fife  
 1872 Robertson, James, Moorgate, Cumberland  
 1870 Robertson, James A. (late Chapel Park, Kingussie), Virginia, U.S.  
 1873 Robertson, James F., New Mains, Prestonkirk  
 1874 Robertson, James Hope, Biel Grange, Prestonkirk  
 1851 Robertson, James Stewart, W.S., of Edradynate, Ballinluig  
 1874 Robertson, John, of Grishernish, Portree  
 1855 Robertson, John, Mount Abundance, Queensland  
 1854 Robertson, J., Glencrispisdale, Strontian  
 1859 Robertson, John, S.S.C., Edinburgh  
 1870 Robertson, John, West Mitchellton, Lochwinnoch  
 1864 Robertson, J., Old Blair, Blair-Athole  
 1865 Robertson, John, of Blairbeth, Rutherglen  
 1867 Robertson, J., Bellaty, Glenisla, Alyth  
 1874 Robertson, John, of Rhyrie, Fearn  
 1873 Robertson, John S., 5 Pitt Terrace, Stirling  
 1828 Robertson, L., 5 Melville Crescent, Edinburgh  
 1857 Robertson, Neil, Balquhain, Alexandria  
 1872 Robertson, Peter, Achilty, Dingwall  
 1872 Robertson, Peter, 48 Holmhead Street, Glasgow  
 1870 Robertson, Peter D., Etteridge, Kinlochmoidart  
 1862 Robertson, Peter S., Trinity Nursery, Trinity, Edinburgh  
 1847 Robertson, Major-General Richardson, of Tullybelton, C.B., Bankfoot  
 1872 Robertson, Robert, West Barns, Dunbar  
 1861 Robertson, Stewart Souter, yr. of Lawhead, Carnwath  
 1859 Robertson, W. M., of Gartloch, 153 Queen Street, Glasgow  
 1874 Robertson, William, Burnside, Ballindalloch  
 1826 Robertson, William, of Kinlochmoidart, Strontian  
 1857 Robertson, Wm., Cuttlebrae, Fochabers  
 1868 Robertson, William, V.S., Kelso  
 1870 Robertson, Wm. A., Abbotshill, Forres  
 1872 Robeson, George, Brotherston, Kelso  
 1863 Robeson, R., Springwells, Coldstream  
 1859 Robey, Robert, Engineer, Lincoln  
 1851 Robinow, Adolph, 21 Clarendon Crescent, Edinburgh  
 1871 Robinson, Robert, Castlehill, Inchture  
 1841 Robson, Charles, Lurdenlaw, Kelso

Admitted	Admitted
1803 Robson, Chas., jun., Lurdenlaw, Kelso	1858 Ross, H., jun., Union Bank of Scotland, Tarland
1853 Robson, John, Dyreness, Rochester	1870 Ross, John, The Grove, Ravensglass, Carnforth
1874 Robson, John, jun., Dyreness, Rochester	1874 Ross, John, Muikle Tarrol, Fearn
1851 Rodger, David, Penkiln, Garlieston	1843 Ross, John Leith, of Arnage, Ellon
1854 Rodger, Matthew, of Rossland, Glasgow	1871 Ross, Peter, Arngrove, Torphins
1859 Rodger, Peter, Selkirk	1856 Ross, Thomas, Bachilton, Perth
1838 Rodger, R., Hadlow Castle, Tunbridge	1871 Ross, William, Annesley, Torphins
1865 Rodger, Robert M., Estate Factor, Royal Bank, Airdrie	1857 ROSSLYN, Right Hon. the Earl of, Dysart House, Kirkcaldy
1873 Rodgie, Henry, Rothes Estate Office, Leslie, Fife	1870 Rough, Robert, Wellford, Broxburn
1857 Rodger, Hugh, Hillhead, Kilmarnock	1805 Roughtead, D., Seedsman, Haddington
1865 Roger, William, Wester, Pitlour, Strathmiglo	1870 Routledge, Wm., Elrig, Port-William
1862 Rogers, James S., Rose Mill, Dundee	1857 Rowan, J. M., Atlas Works, Glasgow
1851 Rogerson, G., of Pearceby Hall, Dumfries	1871 Roxburgh, Robert, Seed Merchant, Kinross
1864 Rogerson, James, of Gillesbie, Wamphray, Lockerbie	1837*+ROXBURGHE, His Grace the Duke of, K.T., Floors Castle, Kelso
1837 Rolland, Adam, of Gask, 20 Athole Crescent, Edinburgh	1856 Roy, Alex., Waterton, Inch, Aberdeen
1857 ROLLO, Right Hon. Lord, Duncrub House, Dunning	1871 Roy, Fred. Lewis, of Nenthorn, Kelso
1809 Ronald, J., S.S.C., Fernieside House, Liberton	1871 Roy, Thomas, Tullylumb, Perth
1857 Ronaldson, Alexander, Glasgow	1856 Royds, Robert Whyt, late Balgeddie, Kirkcaldy
1871 Ronaldson, George, of Linwood, Paisley	1846 Russell, Alexander James, C.S., Edinburgh
1860 Rome, R. M., Ruggetshaws, Langholm	1854 Russell, Andrew Walker, of Kenlygreen, Parkhill, Newburgh
1873 Rome, Thos., Northampton Downs, Barcoo River, Queensland— <i>Free Life Member</i>	1867 Russell, A., Wishaw House, Lanarkshire
1863 Romanes, Robert, of Harryburn, Lauder	1854 Russell, Arthur, Royal Bank, Cupar-Fife
1869 Rorrison, John, Dumfries	1859 Russell, David, Silverburn, Leven
1869 Rose, Hugh, Solicitor, Inverness	1835 Russell, Francis Whitworth, late Bengal Civil Service
1875 Rose, Rev. Hugh Francis, of Holme Rose, Fort-George Station	1851 Russell, James M., Greendykes, Tranent
1865 Rose, Jas., Mains of Connage, Inverness	1847 Russell, Dr James, of Breconside, Holmhill, Thornhill
1865 Rose, John, Leanach, Inverness	1860 Russell, James, Parbroath, Cupar-Fife
1865 Rose, Major James, of Kilravock, Nairn	1802 Russell, John, Saughton Hall Mains, Murrayfield
1854 Rose, William, Sheriffston, Elgin	1864 Russell, Lewis, Canon, Dingwall
1863 ROSEBERRY, Right Hon. the Earl of, Dalmeny Park, Edinburgh	1834 Russell, Robert, Edinburgh
1875 Ross, Alexander, Oldtown, Tarland	1853 RUSSELL, Sir William, of Charlton Bart., Gloucester
1868 Ross, Andrew, Parkdargue, Huntly	1858 Rust, James, Paddocklaw, Banff
1874 Ross, Angus, Woolbroker, Fox Street, Glasgow	1872 Rutherford, Andrew, Rumbleton Law, Kelso
1864 Ross, David, Banker, Dingwall	1872 Rutherford, Andrew, Windmill Hill, Berwick
1864 Ross, D. G., Merchant, Dingwall	1860 Rutherford, George, Monteath's Houses, Gorebridge
1874 Ross, Duncan, Hilton, Inverness	1863 Rutherford, G., Printonan, Coldstream
1872 Ross, George, Merchant, Dingwall	1863 Rutherford, Geo., of Scours, Jedburgh
1839 Ross, George, of Pitcalnie, Parkhill	1874 Rutherford, Dr James, Argyllshire Lunatic Asylum, Lochgilphead
1865 Ross, George, Braelangwell, Invergordon	1861 Rutherford, John, Cromwell Park House, Perth
1849 Ross, Lieut.-Colonel George W. H., of Cromarty	1863 Rutherford, John, Eldin Hope, Selkirk
1870 Ross, James, M.D., Linksfield, Elgin	
1863 Ross, James, Newton-lees, Kelso	
1871 Ross, James E., Factor, Abercairny, Crief	

Admitted	Admitted
1871 Rutherford, R., Invereshie, Kingussie	1821 Scott, Lieutenant-Colonel George
1825 Rutherford, William Oliver, of Edgerston, Jedburgh	1863 Scott, George, Mosstower, Kelso
1863 Rutherford, William A. Oliver, yr. of Edgerston, Jedburgh	1861 Scott, Gideon James, Hyndhope, Selkirk
1854 Ruxton, Andrew, South Artrochie, Ellon	1861 Scott, Right Hon. Lord Henry, M.P., Dalkeith
1851 Ruxton, John, M.D., Hill of Fiddos, Culter Cullen, Aberdeen	1853 Scott, Henry, Crosslee, Selkirk
1850 Ruxton, William, West Mains of Colliston, Arbroath	1859 Scott, Hercules, of Brotherton, Bervie
1870 Ryrie, Robert, 34 Park Street, Grosvenor Square, London	1846 Scott, Hugh, of Gala, Galashiels
	1868 Scott, James, Bogton, Torrance of Campsie
	1850 Scott, James, 1 Woodside Place, Glasgow
	1862 Scott, James, Easter Tulloch, Stonehaven
1864 Sadler, Daniel B., late Balmuick, Crieff	1870 Scott, Major-Gen. Jas. C., United Service Club, Edinburgh
1853 Sadler, William, Northern Club, Edinburgh	1873 Scott, James G., Hill of Ruthven, Perth
1869 Saffley, John, of Mornington, Dumfries	1863 Scott, Dr James Robson, of Ashtree, Yetholm
1873 St CLAIR, the Hon. the Master of	1862 Scott, John, Agricultural Commission Agent, Belford
1856 Salmon, J., The Linn, Johnstone	1826 Scott, J., Finnart House, Greenock
1871 Salmond, David S., Mains of Errol, Errol	1870 Scott, John, Clebrig, Laing
1858 Salmond, James, Cairnie, Arbroath	1874 Scott, John, Noss, Wick
1868 Salmond, R., Nether Balfour, Durris	1863 Scott, John Scott Elliot, Buckholm, Galashiels
1815 Salmond, Robert, Banker, Glasgow	1868 Scott, John, Springfield House, Uddingston
1854 SALLOUN, Right Hon. Lord, Philorth House, Fraserburgh	1868 Scott, Malcolm, Balmuldy, Bishopbriggs
1854 Sanderson, James, 10 Pall Mall East, London	1872 Scott, Peter, Chirnside Crofts, Chirnside
1864 Sanderson, William, Corstorphine Bank, Corstorphine	1841 Scott, Captain Robert, late H.E.I.C.S.
1855 SANDILANDS, Hon. James, 31 Princes' Gate, London	1872 Scott, Ralph Erskine, C.A., Edinburgh
1873 Sands, James, Milton, Burn of Cambus, Stirling	1863 Scott, Robert, Kinninghall, Hawick
1873 Sands, Robt., Greenfoot, Gargunnock	1874 Scott, Robert, Easter Manbeen, Elgin
1870 Saunders, R. B., Chapelhill, Kirkcudbright	1873 Scott, Robert, Yokieshill, Mintlaw
1862 Searth, Pillans, W.S., late Leith	1871 Scott, Thos., Gateside, Bridge of Earn
1813 Searth, Robert, of Kinsearth, Finstown, Orkney	1857 Scott, Thomas, of Croftbank, Uddingston
1851 Seobie, John, Lochinver, Golspie	1863 Scott, T. Whitten, Kelso
1875 Seobie, Niel M., Mid Fearn, Ardgay	1860 Scott, T. Robson, of Newton, Jedburgh
1854 Seoom, Kenneth, 46 Rankellor Street, Edinburgh	1861 Scott, Right Hon. Lord Walter, Dalkeith
1850 Scott, Alex., Beanton, Haddington	1850 Scott, Walter, Glendronach, Huntly
1860 Scott, A., Hopetoun, South Queensferry	1863 Scott, W., Oxnam Nook, Jedburgh
1848 Scott, Andrew, Glendouglas, Jedburgh	1857 Scott, Wm., Spylaw, Kelso
1875 Scott, Andrew, Balnakiel, Durness, Laing	1855 Scott, Wm., Wester Rora, Mintlaw
1864 Scott, Right Hon. Lord Charles, Dalkeith	1862 Scott, William, of Burnside, Alyth
1842 Scott, C. G., of Malleny, Balerno	1863 Scott, William, Howford, Ettrick, Selkirk
1857 Scott, C., Newtonlees, Dunbar	1857 Scott, William, Urquhart Road, Old Meldrum
1831 Scott, C. C., of Hawkhill, Largs	1868 Scott, William, Cononsyth, Arbroath
1859 Scott, D., 3 Craig Street, Montrose	1863 Scott, W. Elliot, of Peel, Newcastleton
1849 Scott, D., Meadowfield, Duddingston, Edinburgh	1863 Scott, Sir William Monteath, of Ancrum, Bart., Jedburgh
1866 Scott, D. G. C., Parks of Inshes, Inver-	1872 Scoular, John, Crook, Stirling
	1842†SEAFIELD, Rt. Hon. the Earl of, Cullen House, Cullen

Admitted	Admitted
1875 Seatter, William, Sairskail, Rousay, Orkney	1859 Shirreff, Charles H., Corn Factor, Edinburgh
1872 Selby, B. P., Paston, Coldstream	1847 Shirreff, David, Muirton, Drem
1872 Selby, Robt., Hassendean Bank, Denholm, Hawick	1850 Shirriff, Samuel D., Saltcoats, Drem
1863 Selby, Ephraim, Hassendean Bank, Hawick	1872 Shivas, Andrew, Bogbain, Tain
1830†SELKIRK, Right Hon. the Earl of, St Mary's Isle, Kirkcudbright	1854 Shortreed, R., Attonburn, Yetholm
1871 Sellar, Alex. G., Ironmonger, Elgin	1873 Sievwright, Wm., National Bank, Lerwick
1849 Sellar, P. Plenderleith, Hartfield, Tain	1866 Sim, Alexander, Fawells, Inverurie
1868 Sellar, R., Implement Maker, Huntly	1870 Sim, Henry, Ardullie, Evanton
1857 Sempull, John, Aldie, Tain	1875 Sim, John Fraser, Oban
1868 Semple, J., Mains of Dumbarrow, Arbroath	1858 Sim, William, 4 St Bernard's Crescent, Edinburgh
1857 Semple, Thos., Carradale, Campbeltown	1871 Sime, And., Balgay, Inchture
1854 Seton, Alex., of Preston, Linlithgow	1873 Sime, Peter W., 16 George Street, Edinburgh
1848 Seton, George, Advocate, Edinburgh	1830 Simpson, Alex. Horatio, late Hayes, Uxbridge
1859 Seton, Henry, V.S., Tollcross, Edinburgh	1860 Simpson, Alex., Smeaton, Dalkeith
1834 SETON, Sir W. Coote, of Pitmedden, Bart., Aberdeen	1853 Simpson, George, Bedrule, Jedburgh
1873 Shairp, William, Poppletrees, Stirling	1868 Simpson, George, Burreldales, Alvah, Banff
1863 SHAND, Hon. Lord, New Hailes, Musselburgh	1869 Simpson, George, Viewfield House, Whitburn
1868 Shand, George, Ordens, Boyndie, Banff	1851 Simpson, James, Mawcarse, Milnathort
1870 Shand, John, M.D., Oakley House, Kirkcudbright	1839 Simpson, Robert, of Cobairdy, Huntly
1844 Shand, John, W.S., Edinburgh	1874 Simson, C.S., of Threepwood, 6 India Street, Edinburgh
1864 Shand, William, New York	1861 Simson, George, Courthill, Kelso
1871 Sharp, James, Blackford, Perthshire	1871 Simson, Thos., Blainslie, Lander
1846 Sharp, James, Helensburgh	1839 Sinclair, A., 133 George Street, Edin.
1873 Sharp, John, Townhead, Quoigs, Greenloaning, Braco	1859 Sinclair, Arch., Minard, Inverary
1871 Sharp, Peter, Bardrill, Blackford	1863 Sinclair, David, Loirston, Aberdeen
1871 Sharp, Thomas, Clathymore, Auchterarder	1872 Sinclair, Duncan, Tullygarth, Alloa
1835 Shaw, Charles, W.S., Sheriff-Substitute, Lochmaddy	1830 Sinclair, James, of Forss, Thurso
1872 Shaw, Chas. G., Dumfries Estate Office, Cumnock	1858 Sinclair, James, Walnut Grove, Perth
1850 Shaw, Hary, Bogfern, Tarland	1857 SINCLAIR, Sir J. G. T., of Ulbster, Bart., M.P., Thurso Castle, Thurso
1863 Shaw, James, Skaithmuir, Coldstream	1875 Sinclair, John, Aucheneir, Taynult
1863 Shaw, James, Tilliching, Lumphanan	1869 Sinclair, Peter, Upper Largie, Kilmartin
1873 Shaw, John, of Arrowe Park, Birkenhead	1864 SINCLAIR, Sir Robert C., of Stevenson, Bart., Achvardsdale Lodge, Reay Thurso
1861 Shaw, William, Finegand, Glenshee, Blairgowrie	1872 Sinclair, W. S. Thomson, yr. of Freswick, Dunbeath Castle, Caithness
1838 Shawe, R. F., of Lotherton Hall, South Milford, Yorkshire	1850 Sievwright, James, The Grove, Torquay
1857 Shennan, James, Balig, Kirkcudbright	1831 Skene, William F., W.S., Edinburgh
1844 Shepherd, George, Shethin, Tarves	1823 Skinner, Capt. C. G. Macgregor, Carisbrooke House, Isle of Wight
1865 Shepherd, George, jun., Craigie, Tarves	1859 Skinner, James, Woodside, Aberdeen
1858 Shepherd, Captain T., of Kirkville, Skene, Aberdeenshire	1858 Skinner, John, Little Balquhomery, Leslie
1864 Sherrieff, John Bell, Carronvale, Larbert	1869 Skinner, W., of Corra, W.S., Edinburgh
1872 Shiel, And., Impt. Dealer, Coldstream	1874 Skinner, Wm. M., Dramin, Ballindalloch
1869 Shield, George, Chemist, Arbroath	1857 Skirving, Adam, of Croys, Dalbeattie
1871 Shields, John, Rossie Ochil, Perth	1850 Skirving, James, Luffness Mains, Drem
1866 Shiels, George, Horsupcleuch, Dumse	1846 Skirving, R. Scot, 29 Drummond Place, Edinburgh
1820 Shireff, Charles, 2 Grosvenor Crescent, Edinburgh	1858 Sleigh, John Land-Surveyor, Strichen Mains, Strichen



Admitted

- 1863 Slipper, R. B., 427 New Cross Road, London  
 1861 Sloan, D., Coachbuilder, Dumfries  
 1870 Sloan, John, Barnhill, Patna, Ayrshire  
 1869 Sloan, William, Brierside, Monkton, Ayr  
 1843 Small, David, Writer, Dundee  
 1859 Small, Jas., of Dirnanean, Pitlochry  
 1870 Small, John L., of Foodie, St Andrews  
 1857 Small, Lindsay, St Andrews  
 1864 Smart, James, Liberton Park, Liberton  
 1858 Smart, John, Glasgowgow, Blackburn, Aberdeen  
 1873 Smeaton, Rev. John (of Coul), Tulliallan Manse, Kincardine, Alloa  
 1870 Smellie, Henry, West Edge, Liberton  
 1857 Smith, Adam, Stevenson Mains, Haddington  
 1847 Smith, Alex., Civil Engineer, 26 St Nicholas Street, Aberdeen  
 1852 Smith, Alexander (A. & W. Smith & Co.), Westbourne, Govan, Glasgow  
 1863 Smith, Alexander, Letham, Berwick  
 1864 Smith, Alexander P., Munlochy Farm, Munlochy  
 1862 Smith, A., Willowbrae House, Edin.  
 1856 Smith, Andrew, Castlemains, Douglas  
 1864 Smith, Andrew, Solicitor, Dingwall  
 1868 Smith, Andrew, Castle Mains, Gifford  
 1874 Smith, Archibald Haddow, 1 India Buildings, Edinburgh  
 1853 Smith, C., Whittingham, Prestonkirk  
 1836 Smith, C. H. Johnstone, late Edinburgh  
 1833 Smith, David, W.S., Edinburgh  
 1839 Smith, E. B., of Blackwood House, Ecclefechan  
 1864 Smith, F. C., Hoprig, Cockburnspath  
 1862 Smith, George, 20 Lynedoch Street, Glasgow  
 1872 Smith, G. P., Crooks, Coldstream  
 1853 Smith, Major H., of Cruicksfield, Dunse  
 1857 Smith, Hugh, 8 Cecil Place, Glasgow  
 1855 Smith, James, of Olrig, Thurso  
 1857 Smith, James, Broomhill, Partick  
 1857 Smith, Jas., 26 Dundas Street, Edinburgh  
 1859 Smith, James, 11 Dixon St., Glasgow  
 1869 Smith, J. Mullochard, Ballindalloch  
 1872 Smith, Jas. F., Fireburn Mill, Coldstream  
 1873 Smith, James, Pittengardner, Fordoun  
 1851 Smith, John, Advocate, Aberdeen  
 1873 Smith, John, Balmaln, Fettercairn  
 1874 Smith, John, Cragganmore, Ballindalloch  
 1865 Smith, John, Inverallan, Grantown  
 1874 Smith, John, Westmains of Campfield, Banchory  
 1852 Smith, J. Gordon, Minmore, Ballindalloch  
 1870 Smith, J. P., Glasgow  
 1867 Smith, J. Turnbull, C.A., Edinburgh

Admitted

- 1872 Smith, Peter, Crooks, Coldstream  
 1839 Smith, Robert, S.S.C., Edinburgh  
 1850 Smith, Robert, Ladyland, Dumfries  
 1864 Smith, Robert, Brentham Park, Stirling  
 1872 Smith, Robt. G., Almond Bank, Mid-Caldar  
 1854 Smith, R. M., 4 Bellevue Crescent, Edinburgh  
 1874 Smith, Sidney, Mill of Boyndie, Banff  
 1850 Smith, Thomas, Dalfibble, Dumfries  
 1873 Smith, Thomas, Dunnabie, Lockerbie  
 1874 Smith, Thomas, Raitloan, Nairn  
 1870 Smith, Thomas, Sorbie, Langholm  
 1854 Smith, Wm., Melkington, Cornhill, Northumberland  
 1856 Smith, Wm., West Drums, Brechin  
 1858 Smith, William, Middleton, Balquhairn, Inverurie  
 1860 Smith, William, Banker, Moniaive  
 1863 Smith, W., Stone of Morphee, Montrose  
 1868 Smith, William, New Mains of Urie, Stonehaven  
 1869 Smith, Wm., Chanlockfoot, Penpont  
 1873 Smith, Wm. B., Stoneleigh Villa, Leamington—*Free Life Member*  
 1874 Smithson, Joseph S., General Manager, W. & H. M. Goulding, North Wall, Dublin  
 1826 Smollett, A., of Bonhill, Cameron House, Alexandria, N.B.  
 1846 Smythe, William, of Methven, Perth  
 1857 Snodgrass, Allan, Mollanhu, Cardross  
 1857 Somervail, P., Glendevon, Winchburgh  
 1857 Somervell, G., of Sorn, Mauchline  
 1848 Somerville, J., Birch Villa, Peebles  
 1858 Somerville, James, S.S.C., Edinburgh  
 1850 Somerville, Wm., Merchant, Glasgow  
 1854 Souter, Alexander, Banff  
 1850† Southesk, Right Hon. the Earl of, K.T., Kinnaird Castle, Brechin  
 1865 Spears, W. R., writer, Kirkcaldy  
 1858 Speir, Robert, Blair Park, Largs  
 1838 Speir, Thos., of Blackstoun, Burnbrae, Johnstone  
 1873 Speirs, Alex. Graham, of Culcreuch, Fintry, Glasgow  
 1838 Speirs, T. Dundas, Burnfoot, Houston  
 1860 Spence, Adam White, Earnbank, Bridge of Earn  
 1872 Spens, James, Low Ardwell, Stranraer  
 1872 Spofford, Joseph Louis, Banker, 29 Broadway, New York  
 1863 Spowart, T., of Broomhead, Dunfermline  
 1870 Sproat, Robert, Lennox Plunton, Kirkcudbright  
 1830 Sprot, James, of Spot, Dunbar  
 1830 Sprot, John, Ayr  
 1830 Sprot, Mark, of Riddell, Lilliesleaf  
 1826 Sprot, Thomas, W.S., Edinburgh  
 1836 Stables, W. A., Cawdor Castle, Nairn  
 1845† Stair, Right Hon. the Earl of, K.T., Oxenfoord Castle, Dalkeith

## Admitted

- 1854 Starforth, John, Architect, Edinburgh  
 1858 Stark, Andrew, Wester Bogie, Kirkcaldy  
 1862 Stark, Ralph, of Summerford, Camelon, Falkirk  
 1870 Stark, Robert, Kirkcaldy  
 1861 Stark, W., Williamston, Mid-Calder  
 1869 Statter, Thomas, jun., Stand Hall, Whitefield, Manchester  
 1872 Stavert, Archd., of Hoscoate, 18 Royal Terrace, Edinburgh  
 1851 Stedman, J., Wester Ulston, Boundary Bank, Jedburgh  
 1862 Steedman, J., late Charleston, Dunfermline  
 1870 Steel, Gavin, 13 North Manor Place, Edinburgh  
 1871 Steel, Gavin, of Hill Park, 5 Queen Street, Glasgow  
 1872 Steel, James, Fallamill, Greenburn  
 1853 Steele, Robert, Greenock  
 1828 Steele, William, Sheriff-Substitute of Dumbarton  
 1874 Stell, Gourlay, R.S.A., Edinburgh  
 1854 Stegmann, Conrad, Merchant, Leith  
 1850 Stenhouse, G., West Pilton, Blackhall  
 1850 Stenhouse, J., Southfield, Corstorphine  
 1861 Stenhouse, James, Turnhouse, Cramond  
 1858 Stephen, James, Conglass, Inverurie  
 1874 Stephenson, Richard, Chapel, Dunse  
 1845 Steuart, Andrew, of Auchluncart, Keith  
 1857 Steuart, D., of Steuart Hall, Stirling, Herongate, Brentwood, Essex.  
 1835 STEUART, Sir Henry J. Seton, of Allanton, Bart., Touch, Stirling  
 1842 Steuart, James, W.S., Edinburgh  
 1864 Steuart, James, junior, Dalkeith Park, Dalkeith  
 1859 Steuart, Patrick, Middlegill, Moffat  
 1864 Steuart, Captain Robert, of Carfin, Westwood, West Calder  
 1855 Steuart, Robert, Brownlee, Carluke  
 1833 Steuart, William, London  
 1839 Stevenson, Alexander, Banker, Langholm  
 1875 Stevenson, Alex. Shannan, Auchineilan, Lochgilphead  
 1855 Stevenson, Andrew, Halls, Dunbar  
 1853 Stevenson, David, F.R.S.E., Member of the Institution of Civil Engineers, Consulting Engineer to the Society, Edinburgh  
 1853 Stevenson, John B., New Zealand  
 1864 Stevenson, John, Changue, Cumnock  
 1860 Stevenson, Robert, 17 Palmerston Road, Edinburgh  
 1852 Stevenson, Thomas, Mount-Lothian, Penicuik  
 1872 Stevenson, Wm., Lochgrog, Bishop-  
 1860 Stewart, Alexander, late Tempar

## Admitted

- 1860 Stewart, Andrew, Auctioneer, Dumfries  
 1871 STEWART, Sir A. Douglas, of Grandtully, Bart., Perth  
 1874 Stewart, Archibald, of Ensay, Turbert, Harris  
 1823 Stewart, Charles, of Hillside, Lockerbie  
 1840 Stewart, Charles, of Brin, Solicitor, Inverness  
 1874 Stewart, Charles, Collielaw, Lauder  
 1858 Stewart, Charles, Tighnduin, Killin  
 1842 Stewart, David, London  
 1869 Stewart, David W., of Grange, Lockerbie  
 1870 Stewart, Donald, Chapel Park, Kin-gussie  
 1859 Stewart, Donald, Bruar, Blair Athole  
 1870 Stewart, Duncan, Mosspeeble, Ewes, Langholm  
 1863 Stewart, Commander Duncan, R.N., New Club, Edinburgh  
 1844 Stewart, G., Kirkchrist, Kirkcudbright  
 1874 Stewart, George, Auctioneer, Dumfries  
 1871 Stewart, George, V.S., Perth  
 1822 STEWART, Admiral Sir H., G.C.B., Dourie Bank, Port-William  
 1838 Stewart, H. B., of Balnakeilly, Pitlochry  
 1857 Stewart, H. G. Murray, of Broughton, Cally, Gatehouse  
 1871 Stewart, James, Blairfettie, Blai Athole  
 1851 Stewart, J., Pitskelly, St Martins, Perth  
 1858 Stewart, James, Heathfield, Irvine  
 1857 Stewart, James, Ballyargan, Ardrishaig  
 1869 Stewart, James W., C.E., Edinburgh  
 1873 Stewart, John, Bochastle, Callander  
 1823 Stewart, John, of Dalguise, Duukeld  
 1854 Stewart, John, Burnside, Strathaven  
 1855 Stewart, John, Upper Androscale, Rothesay  
 1852 Stewart, John, Duntulm, Portree  
 1873 Stewart, John, jun., Greystone, Dunc  
 1871 Stewart, Captain John C., of Fasnacloich, Appin, Fort-William  
 1824 Stewart, J. Lorn, of Coll, Campbeltown  
 1853 Stewart, John Archd. Shaw, 18 Queen's Gate, London  
 1862 Stewart, Malcolm, Fife Keith, Keith  
 1837 Stewart, M. S., of Southwick, Dumfries  
 1869 Stewart, Mark John, of Blairderry, M.P., Ardwell, Stranraer  
 1848 STEWART, Sir M. R. Shaw, of Blackhall, Bart., Greenock  
 1863 Stewart, Neil F., Bryn-Tirion, Bangor, North Wales  
 1859 Stewart, Osmond de Haviland, Waterhead, Lockerbie  
 1860 Stewart, Peter, Cowburn, Lockerbie  
 1854 Stewart, Major Robert, of Ballechin, Ballinluig

Admitted

- 1858 Stewart, Robert, of Ingliston, Ratho  
 1871 Stewart, Major Robert, of Ardvoirlich, Lochearnhead  
 1873 Stewart, Robert, Kippenross, Dunblane  
 1846 Stewart, Robert H. Johnstone, of Physgill, Glasserton, Whithorn  
 1857 Stewart, Samuel, Sandhole, Fraserburgh  
 1859 Stewart, Walter, Aberfeldy  
 1850 Stewart, William, Tonreoch, Campbelltown  
 1857 Stewart, William, 24 Maclean Street, Plantation, Glasgow  
 1860 Stewart, William, Saddler, Aberfeldy  
 1872 Stewart, William, Octofad, Port Charlotte, Islay  
 1868 STIRLING, Sir C. E. F., of Glorat, Bart., Milton of Campsie  
 1864 Stirling, Gilbert, Larbert, Falkirk  
 1857 Stirling, Major Graham, of Craigbarnet, Lennoxtown  
 1852 Stirling, James, C.E., Edinburgh  
 1867 Stirling, James, of Garden, Kippen, Stirling  
 1833 Stirling, John, of Kippendavie, Dunblane  
 1865 Stirling, Major John S., of Gargunnoch, R.A., Woolwich  
 1839 Stirling, T. Graham, of Strowan, Crieff  
 1855 Stirling, William, of Tarduf, Linlithgow  
 1867 Stobo, Andrew, Porterstown, Thornhill  
 1860 Stobo, Robert, of Hallidayhill, Auld-girth, Dumfries  
 1855 Stodart, David, Banker, Lanark  
 1875 Stodart, George, Netheriton, Newton Mearns, Renfrewshire  
 1851 Stodart, John, Broomhouse, Corstorphine  
 1871 Stodart, John, Shettleston, Glasgow  
 1864 Stodart, Thomas, Boreland, Lockerbie  
 1855 Stodart, William, Wintonhill, Tranent  
 1861 STORMONT, Right Hon. Viscount, Seone Palace, Perth  
 1869 Stordy, Robert, St Leonard's Hill, Edinburgh  
 1850 Storie, Francis, V.S., East Linton, Prestonkirk  
 1832 Stott, Gibson, 27 Victoria Street, Westminster, London  
 1859 Stott, Joseph Hood, Niddry Street, Edinburgh  
 1874 Strachan, Andrew, Sophock, Old Meldrum  
 1858 Strachan, James, Wester Foulis, Alford  
 1858 Strachan, Lewis, Cluny of Raemoir, Banchory  
 1857 Strang, J., High Crewburn, Strathaven  
 1847†STRATHALIAN, Right Hon. Viscount  
 1867†STRATHMORE, Right Hon. the Earl of, Glamis Castle, Glamis

Admitted

- 1874 Stratton, David, 13 Middleby Street, Edinburgh  
 1859 Strong, Thomas, W.S., Edinburgh  
 1863 Stuart, Alexander C., of Eaglescarnie, Haddington  
 1865 Stuart, Alexander, of Laithers, Turriff  
 1873 Stuart, Charles, Tomindugle, Knockando, Craigellachie  
 1868 Stuart, Henry, Montford, Rothesay  
 1873 STUART, The Right Hon Sir John, of Lochcarron, Ross-shire  
 1849†SUTHERLAND, His Grace the Duke of, K.G., Dunrobin Castle, Golspie  
 1871 Sutherland, D. M., Burray, Kirkwall  
 1853 Sutherland, Eric, Tannachie House, Fochabers  
 1849 Sutherland, George, of Forse, Lybster  
 1871 Sutherland, George, The Peel, Tibbermuir  
 1865 Sutherland, James B. (of Lanehead, Dunscore), S.S.C., Edinburgh  
 1856 Sutherland, Joseph, Melbourne  
 1856 Sutherland, Robert, late Shiness, Lairg  
 1852 Sutherland, S., Stocksbridge Offices, Sheffield  
 1865 Sutherland-Walker, E. C., of Skibo, Skibo Castle, Dornoch  
 1839 SURTIS, Sir George Grant, of Balgone, Bart., Balgone, Drem  
 1858 Swan, James, Live Stock Agent, Edinburgh  
 1869 Swan, James, Inverpeffer, Carnoustie  
 1851 Swan, John, Cattle Salesman, Edinburgh  
 1865 Swan, P. D., Provost of Kirkecaldy  
 1852 Swan, Robert, Writer, Kelso  
 1863 Swan, Samuel, Bush, Jedburgh  
 1858 Swan, Thomas, Live Stock Agent, Edinburgh  
 1871 Swan, William, Moat Mill, Dundee  
 1861 Swann, James, Collierhall, Douglas  
 1859 Swann, J. R., late Leith Walk, Edinburgh  
 1865 Swanwick, R., Royal Agricultural College Farm, Cirencester  
 1857 Swinburne, Capt., R.N., of Eilan Shona, Strontian  
 1841 Swinton, Archibald Campbell, of Kimmerghame, Dunse  
 1862 Swinton, P. Burn, Holyn Bank, Gifford  
 1853 Sydserff, Thomas Buchan, of Ruchlaw, Prestonkirk  
 1874 Syme, David, Manager of The Lawson Seed and Nursery Co. Limited, 1 George IV. Bridge, Edinburgh  
 1859 Syme, George, 171 High Street, Kirkcaldy  
 1875 Syme, James, Millbank, Edinburgh  
 1857 Syme, William, Craigie, Leuchars, Fife  
 1868 Symington, G. C., Kirkcarswell, Kirkcudbright

## Admitted

1848 Symington, T., late Eastside, Penicuik  
 1868 Symington, Gilbert, City of Glasgow  
 Bank, Glenluce

1845 Tait, Alexander D., of Milrig, Kilmar-  
 nock

1874 Tait, George, Veterinary Surgeon, Elgin

1846 Tait, James, Banker, Kelso

1866 Tait, James Campbell, W.S., Edinburgh

1872 Tait, James, Berryhill, Kelso

1834 Tait, J., Advocate, 41 Northumberland  
 Street, Edinburgh

1842 Tait, Joseph, of Haughland, Elgin

1863 Tait, William, Vencheon, Kelso

1862 Tait, William Reid, Mina Villa, Thurso

1862 Tawse, John, W.S., Edinburgh

1859 Tawse, John Wardrope, W.S., Edin.

1858 Tayler, W. J., of Glenbarry, Rothiemay  
 House, Huntly

1863 Taylor, Alexander, Hillhouse, Lauder

1869 Taylor, Andrew, Banker, Cupar-Fife

1858 Taylor, Geo., of Kirktonhill, Montrose

1873 Taylor, James, Land Steward, Buchanan,  
 Drymen

1858 Taylor, John B., Seton West Mains,  
 Prestonpans

1861 Taylor, John, Redcastle, Chance Inn

1870 Taylor, Joseph, Potholm, Langholm

1853 Taylor, M., Letter Farm, Cove, Greenock

1857 Taylor, R., late Laggan, Campbeltown

1857 Taylor, Robert, Dumfrenny, Banchory

1872 Taylor, Thos., Seed Merchant, Dalkeith

1870 Teenan, Michael, New Bazaar, Dumfries

1857 Templeton, Robert, Rannachan, Camp-  
 beltown

1853 Tennant, Charles, of the Glen, Peebles

1833 Tennant, John, St Rollox, Glasgow

1863 Tennant, Robert, of Rosehall, Laig

1872 Tennant, Thos., Crofthead, Strathaven

1873 Terris, James, jun., Dullomuir, Blair  
 Adam

1871 Thom, James, Pitlochrie, Strathmiglo

1858 Thom, James C., Quithelhead, Durris,  
 Aberdeen

1871 Thom, William, Demperton, Anch-  
 ternmucht

1855 Thomas, James, Forthar, Kettle, Lady-  
 bank

1861 Thomas, Robert, Bannatyne House,  
 Newtyle

1872 Thomas, William, Pinnacle, Ancrum,  
 Jedburgh

1845 Thompson, Andrew, Berwick-on-Tweed

1868 Thompson, Geo., of Pitmedden, Dyce,  
 Aberdeen

1867 Thompson, Henry, of High Green,  
 Ramshope, Otterburn

1872 Thompson, John, Bailieknowe, Kelso

1870 Thompson, Wm., Belville, Coldstream

1874 Thoms, Geo. Hunter, yr of Aberlemno,  
 Advocate, Sheriff of Caithness, Orkney,  
 and Shetland

## Admitted

1861 Thoms, Patrick Hunter, of Aberlemno,  
 Dundee

1871 Thomson, Alex., Barmeil, Port William

1825 Thomson, Alexander, Banker, Greenock

1867 Thomson, A., of Mainhill, St Boswell's

1873 Thomson, Alex., Mains, Tillicoultry

1867 Thomson, Charles W., C.A., Edin-  
 burgh

1869 Thomson, Duncan M., Coachbuilder,  
 Stirling

1836 Thomson, George, of Burnhouse, New  
 Club, Edinburgh

1854 Thomson, George, Arkland Villa, Canaan  
 Lane, Edinburgh

1863 Thomson, George, Hopton, Ancrum,  
 Jedburgh

1855 Thomson, James, Mungoswalls, Dunso

1853 Thomson, James, Holmes, Broxburn

1861 Thomson, J., Belmont, Dumfries

1863 Thomson, Jas., Newseat of Dumbreck,  
 Udney

1874 Thomson, John, Avonhead, New Monk-  
 land

1869 Thomson, John, Blaiket, Crockettford,  
 Dumfries

1869 Thomson, John, 49 Hope Street, Glasgow

1863 Thomson, J., Newton of Skene, Dun-  
 echt, Aberdeen

1848 Thomson, John Anstruther, of Charle-  
 ton, Colinsburgh

1867 Thomson, John Comrie, Sheriff-Substi-  
 tute of Aberdeen and Kincardine

1874 Thomson, J. Grant, Wood Manager,  
 Grantown, Strathspey

1869 Thomson, J.S., McCheynston, Dumfries

1870 Thomson, Lockhart, S.S.C., 114 George  
 Street, Edinburgh

1873 Thomson, Mitchell, 43 George Street,  
 Edinburgh

1859 Thomson, Peter, Cowcoch, Abergele,  
 North Wales

1874 Thomson, Robert, Burnbank, Blair-  
 drummond

1857 Thomson, Robert, Seggie, Guard Bridge

1864 Thomson, R. J., 25 Villiers Street,  
 Charing Cross, London

1850 Thomson, Thomas, Merchant, Glasgow

1844 Thomson, William, of Balgowan, Perth

1854 Thomson, W., 10 Stafford Street, Edin-  
 burgh

1873 Thomson, William, Nyaad, Stirling

1871 Thomson, William, Coachbuilder, Perth

1875 Thomson, Wm., Aberdeen Town and  
 County Bank, Tarnad

1872 Thomson, W. A., 7 Bonnington Place,  
 Edinburgh

1869 Thomson, Wm. Hill, Hillwood, Ratho

1841 Thomson, William Thomas, of Bonaly,  
 Colinton

1859 Thorburn, David, Calgary, Tobermory

1869 Thornton, James, Crofthead, Green-  
 burn

Admitted

- 1872 Thornton, Thomas, Crofthead, Greenburn  
 1824 Threshie, David Scott, W.S., Jersey  
 1824 THRIEPLAND, Sir P. M., of Fingask, Bart., Errol  
 1872 Thyne, John, 21 Danube Street, Edin.  
 1859 Thynne, William, Hoprig Mains, Tranent  
 1844 Timins, William, of Hillfield, Stanmore, Middlesex  
 1869 Tinning, John, Chillesford Lodge, Sudbourne Hall, Wickham Market, Suffolk  
 1859 Tod, Alexander, Aitkendean, Lasswade  
 1872 Tod, George, Bankhead, Dunfermline  
 1870 Tod, James, late Anchenhoan, Campbelltown  
 1869 Tod, James Carstairs, Gorgie Mains, Edinburgh  
 1870 Tod, John W., W.S., 66 Queen Street, Edinburgh  
 1853 Tod, Robert, Cardrona Mains, Peebles  
 1834 Tod, Captain R. A. B., of Howden, Mid-Calder  
 1870 Tod, Thomas M., West Brackly, Kinross  
 1851 Tod, William, Gospetrie, Kinross  
 1857 Tod, William, Hilton, Cupar-Fife  
 1864 Tod, William, Glenree, Lamlash, Arran  
 1858 Todd, James, late Dunure Mains, Maybole  
 1865 Todd, James, Castle Mains, Dirleton, Drem  
 1869 Todd, William, Auchness, Stranraer  
 1871 Todd, William, Auctioneer, Peebles  
 1865 Tolmie, Alex., Ballispardeen, Ardersier  
 1871 Torrance, Archibald P., Kippielaw, Dalkeith  
 1863 Torrance, George, Sisterpath, Dunso  
 1863 Torrance, T., Laws, Chirnside  
 1872 Torrance, William, Burnhouse Villa, Camps, Mid-Calder  
 1873 Torry, Adam Ogilvie, St Anne's, Coupar-Angus—*Free Life Member*  
 1870 Towerson, John, Corkickle, Whitehaven  
 1846 Traquair, Ramsay H., Colinton, Slateford  
 1857 Trench, Henry, of Cangort Park, Roscrea, Ireland  
 1874 Trotter, Angus, Auctioneer, Inverness  
 1841 Trotter, Chas., of Woodhill, Blairgowrie  
 1865 Trotter, Couns., 11 Melville Street, Edinburgh  
 1865 Trotter, Lieut.-Colonel H., of Morton Hall, Edinburgh  
 1829 Trotter, Robert Knox, of Ballindean  
 1875 Trotter, Robert, Garguston, Beaulieu  
 1866 Trotter, T. C., 54 Park Street, Grosvenor Square, London, W  
 1869 Trotter, Lieut.-Colonel, of the Bush, Edinburgh  
 1850 Tudhope, G., 62 Pollock Street, Glasgow

Admitted

- 1873 Tulloch, James, Dalcs, Inverkeithing  
 1844 Turnbull, Alexander, Thornington, Kilham, Coldstream  
 1874 Turnbull, David, W.S., 12 Belgrave Crescent, Edinburgh  
 1857 Turnbull, Gregor, Merchant, Glasgow  
 1863 Turnbull, J., Lempitlaw, Eastfield, Kelso  
 1844 Turnbull, John, of Abbey St Bathans, W.S., Edinburgh  
 1863 Turnbull, John, East Middle, Hawick  
 1863 Turnbull, John, Palace, Jedburgh  
 1862 Turnbull, Mark, Melrose Mills, Melrose  
 1859 Turnbull, P., Little Pinkerton, Dunbar  
 1850 Turnbull, S., Bonhill Place, Renton  
 1863 Turnbull, William J., Graden, Kelso  
 1872 Turnbull, William, Middleton, Gorebridge  
 1863 Turnbull, William George, Spittal, Jedburgh  
 1844 Turner, A., of Glentyre, Bridge of Earn  
 1853 Turner, Duncan, Corachaive, Sandbank  
 1859 Turner, Frederick J., the Dean, Kilmarnock  
 1853 Turner, John, of Turner Hall, Ellon  
 1873 Turner, Peter, Mainerston, Linlithgow  
 1855 Turner, Richard, Broompark, Mid-Calder  
 1863 Turner, W., Mains House, Linlithgow  
 1868 Turner, William, M.B., Professor of Anatomy, University of Edinburgh  
 1809\*† Tweeddale, Most Noble the Marquis of, K.T., Yester House, Haddington  
 1869 Tweeddale, George, Gilmerton, St Andrews  
 1859 Tweedie, Alexander, Coats, Haddington  
 1873 Tweedie, Alexander Gladstone, Glespin, Douglas, Lanarkshire  
 1853 Tweedie, D., Castle Crawford, Abington  
 1860 Tweedie, James, of Quarter, Rachan House, Biggar  
 1875 Tweedie, James, Denchrie, Prestonkirik  
 1871 Tweedie, Richard, The Forest, Catterick  
 1871 Tweedie, Thomas, Merchant, Annan  
 1863 Tytler, James Stuart, of Woodhouselee, W.S., Edinburgh  
 1864 Tytler, Charles E. F., of Sanquhar, Forres  
 1860 Tytler, Colonel Fraser, of Aldourie, Inverness  
 1873 Udney, John Henry Fullarton, of Udney and Dudwick Udney, Aberdeen  
 1864 Umphray Andrew, of Reawick, Lerwick  
 1864 Urquhart, B. C., of Meldrum, Old Meldrum  
 1858 Urquhart, J. G., of Vellore, Linlithgow  
 1875 Urquhart, John, Dundonnell, Ullapool  
 1873 Ure, John, Westwood, Drip, Stirling  
 1874 Ure, William, Bogton, Falkirk

Admitted	Admitted
1864 Ure, William, Crawfordston, Kippen	1862 Walker, John, 1 Polwarth Terrace, Edinburgh
1853 Usher, John, Stodrig, Kelso	1865 Walker, John, of Ardspeaton, Craigrownie, Roseneath
1872 Usher, John, jun., Gatehousecote, Hawick	1872 Walker, J. P. S., Mountrich, Dingwall
1872 Usher, Thomas, jun., Courthill, Hawick	1844 Walker, Matthew, Glasgow
1857 Vallance, Hugh, Greathill, Strathaven	1844 Walker, Robert, Lathamhill, Glasgow
1858 Vallentine, J., Nether Afflock, Skene	1853 Walker, Robert, Montbleiton, Banff
1860 Vassal, Lieut.-Gen. R., London	1854 Walker, Robert, Leuchars House, Elgin
1864 Veitch, Chris., 5 Carlung Place, Edinburgh	1859 Walker, Robert, Altyre, Forres
1867 Veitch, Walter, Grange, Kinghorn	1861 Walker, Robert, Gannochy, Perth
1856 Vere, C. E. Hope, Ledard, Aberfoyle	1861 Walker, Thomas R., Cupar-Fife
1867 VERNON, Hon. Greville R., Auchans House, Kilmarnock	1859 Walker, W., Balrymonth, St Andrews
1873 Villiers, Frederick Ernest, Closeburn Hall, Thornhill	1858 Walker, Wm., Ardhuncarth, Mossat
1873 Virtue, George, 14 Murray Place, Stirling	1864 Walker, William, Kintree, Elgin
1874 Waddell, A. Peddie, 4 Great Stuart St., Edinburgh	1872 Walker, William, Horse-Dealer, Stirling
1874 Waddell, James, Airdrie, New Monkland	1835 Walker, William S., of Bowland, 125 George Street, Edinburgh
1872 Waddell, John, of Easter Inch, Bathgate	1868 Walker, William Campbell, yr. of Bowland
1869 Waddell, John, Southrigg, Bathgate	1873 Wall, George Y., Durham— <i>Free Life Member</i>
1818 Waddell, William, of Easter Moffat, W.S., Edinburgh	1865 Wallace, David, Lochwood, Coatbridge
1869 Waddell, William, Netherton, Whitburn	1861 Wallace, James, Brake, Denino, Fife
1857 Wakefield, J. Collen, Eastwood Park, Thornliebank	1861 Wallace, John, late Illieston, Broxburn
1857 Wakelin, John, Oil Mills, Musselburgh	1854 Wallace, Robert A., Rhynd, Dunfermline
1873 Walker, Alexander, of Findynate, Balnilling	1870 Wallace, R., Langbarns, Kirkeudbright
1870 Walker, Alexander, Stagebank, Heriot, Gorebridge	1844 Wallace, Wm., of Auchinvole, Kilsyth
1872 Walker, Alex. John, Bowland, Stow	1871 Wallace, William, of Newton of Collesie, Ladybank
1847 Walker, Charles (late Drumblair), Australia	1854 Wallbank, Jonas, Berwick-upon-Tweed
1861 Walker, Fountaine, of Ness Castle, Inverness	1872 Walley, Thos., M.R.C.V.S., Principal of the Veterinary College, Edin., Professor of Cattle Pathology to the Society
1857 Walker, Francis, Craignetherty, Turriff	1873 Walls, Robt., Kerse Mills, Stirling
1863 Walker, Francis, Camptown, Haddington	1845 WALPOLE, The Hon. Henry, Wolterton Park, Aylsham, Norfolk
1858 Walker, Lieut.-Col. George G., of Crawfordton, Thornhill	1873 Walton, George Kent, Long Campton, Shipston-on-Stour, Warwickshire— <i>Free Life Member</i>
1875 Walker, George A., Novar Mains, Evanton	1871 Wanliss, John, Cargill, Perth
1863 Walker, G. J., Portlethen, Aberdeen	1869 Wardrop, W. M., of Bridgehouse
1861 Walker, Henry West, Banker, Auchtermuchty	1874 Wardrop, Robert, Garlaith, Cumnock
1860 Walker, James, of Dalry, Edinburgh	1852 Warnock, A., Bearyards, Bishopbriggs
1847 Walker, James, of Blairton	1862 Warrack, William, Newmill of Fintruy, Aberdeen
1854 Walker, James, Kilpult, Broxburn	1868 Warrand, Capt. A. J. C., Ryefield, Dingwall
1867 Walker, Jas., Brough, Westray, Kirkwall	1858 WARRENDER, Sir G., of Lochend, Bart., Brunsfield House, Edinburgh
1869 Walker, James, Hillhead, St Andrews	1856 Warwick, W., Glencartholm, Canonbie
1848 Walker, John, W.S., Edinburgh	1839 Wason, Rigby, of Corwar, Barrhill
1857 Walker, John, Eastfield, Springburn	1871 Waters, George S., Tister Mains, Hal-kirkroad
1857 Walker, J. E., Cawder Cuilt, Maryhill	1837 Waterston, Charles, Banker, Inverness
	1869 Waterston, James, 29 Queensferry Street, Edinburgh

Admitted

- 1869 Waterston, Wm., 29 Queensferry Street, Edinburgh  
 1875 Watson, Arthur, Easter Busby Farm, Busby, Glasgow  
 1855 Watson, Crawford, The Lone, Tenbury, Worcestershire  
 1859 Watson, Douglas (late Thurster, Wick), New Zealand  
 1848 Watson, George, of Norton, Ratho  
 1870 Watson, Geo., Fushiebrae, Gorebridge  
 1841 Watson, Henry George, C.A., Edin.  
 1870 Watson, Jas. M., 11 Lauriston Park, Edinburgh  
 1869 Watson, John Paton, of Blackford, Rothie-Norman  
 1857 Watson, John, of Neilsland, Hamilton  
 1857 Watson, John, Broadleys, Dunning  
 1864 Watson, John, Culterallers, Biggar  
 1872 Watson, Patrick, Friarstown House, Tallaught, County Dublin  
 1852 Watson, Wm., late The Binns, Dundee  
 1841 Watson, William, Seaside, Errol  
 1863 Watson, W. S., of Burnhead, Bucklands, Hawick  
 1873 Watt, Alex., Primrose, Dunfermline  
 1871 Watt, George, Kilmany, Cupar-Fife  
 1868 Watt, Gordon, Hirn, Banchory-Ternan  
 1856 Watt, James, Biggar  
 1864 Watt, James, Balbarton, Kirkcaldy  
 1875 Watt, James, Garbity, Orton, Fochabers  
 1865 Watt, John, Thomastown, Huntly  
 1853 Watt, Wm. W. G., of Breckness, Kierfield, Stromness  
 1872 Wauchope, Capt., of Niddrie Marischall, Liberton  
 1873 Wauchope, Andrew, Tillicoultry House, Tillicoultry  
 1842 WAUCHOPE, Sir John Don., of Edmonstone, Bart., Edmonstone House Liberton  
 1871 Waugh, Allan, Avonbridge, Falkirk  
 1857 Waugh, J., of St John's Kirk, Biggar  
 1873 Waugh, John, Langshaw, Galashiels  
 1873 Waugh, William, V. S., Stirling  
 1861 Webster, A., of Ruthersford, Edinburgh  
 1853 Webster, James, S.S.C., Edinburgh  
 1863 Webster, J., New Horndean, Berwick  
 1870 Webster, Robt., Airds of Kells, Parton, Castle Douglas  
 1856 Webster, R., Redhouse, Bathgate  
 1863 Weddell, John Wilkie, Lauder Barns, Lauder  
 1874 Wedderburn, Henry Scrymgeour, of Wedderburn, Birkhill, Cupar-Fife  
 1870 Weir, Alex., Newhousemill, East Kilbride  
 1864 Weir, Robert, Brownhill, Carnwath  
 1873 Weir, William, Inches, Falkirk  
 1868 Weir, William, Portland Iron Works, Kilmarnock  
 1850 Welsh, Alexander, Edinburgh

Admitted

- 1855 Welsh, David, Tillytoghills, Fettercairn  
 1869 Welsh, Henry, 6 George Street, Edin.  
 1860 Welsh, John, Kirkton, Hawick  
 1872 Welsh, John, Lowther Street, Whitehaven  
 1853 Welsh, Thomas, of Earlshaugh, Ericstane, Moffat  
 1842 Welwood, Alan A. Maconochie, of Garvoch, Meadowbank, Kirknewton  
 1819+ WEMYSS and MARON, Right Hon. The Earl of Gosford, Haddington  
 1846 Wemyss, D. Sinclair, of Southduu, Ackergill Tower, Wick  
 1872 Wemyss, R. G. E., of Wemyss, Kirkcaldy  
 1863 WHARNCIFFE, Right Hon. Lord, 15 Curzon Street, London  
 1863 White, A., Causeway Bank, Chirnside  
 1861 White, Francis, M.D., Perth  
 1852 White, James, Stockbroker, Edinburgh  
 1863 White, James, of Overton, Glasgow  
 1842 White, John, of Drumelzier, Netherurd House, Dolphinton  
 1863 White, John, of Grougar, 80 Wilson Street, Glasgow  
 1873 White, John, Ardencape Row, Helensburgh  
 1872 White, John A., Shiells Mains, Biggar  
 1868 White, J. F., Grain Merchant, Aberdeen  
 1838 White, Peter, Accountant, Glasgow  
 1842 White, Robert, W.S., Edinburgh  
 1872 White, Robt., Outerston, Gorebridge  
 1838 White, William, Merchant, Glasgow  
 1854 White, Wm., Mousebank, Lanark  
 1872 White, Wm., Lennel Hill, Coldstream  
 1845 Whitehead, Joseph, of Kilnside, Paisley  
 1859 Whitelaw, Alex., M.P., of Gartshore, Gartsherrie House, Coatbridge  
 1850 Whittet, Geo., Easter Drylaw, Davidson's Mains  
 1861 Whitton, Andrew, of Couston, Newtyle  
 1871 Whyte, Angus, Easdale, Oban  
 1870 Whyte, Archd., jun, Cotton of Craigs, Alyth  
 1865 Whyte, James, Little Clinterty, Blackburn, Aberdeen  
 1870 Whyte, James A., Kirkmabreck, Stranraer  
 1853 Whyte, John, Ballochyle, Sandbank  
 1871 Whyte, John, West Denoon, Meigle  
 1875 Whyte, John, Lundin Mill, Largo  
 1860 Whyte, Rev. R., Dryfesdale, Locherbie  
 1868 Whyte, William, Spott, Kirriemuir  
 1870 Wight, Alex., Ironmonger, Forres  
 1865 Wight, Geo., 14 Duke Street, Edinburgh  
 1872 Wight, Robt. B., Ecclaw, Cockburnspath  
 1873 Wight, Thomas, Wire-Worker, Perth  
 1827 Wightman, James Seton, of Courance, Lockhart

Admitted	Admitted
1873 Wightman, James C. Seton, Cour- rance, Lockerbie	1854 Wilson, James, Burnetland, Biggar
1869 Wightman, John Seton, yr. of Cour- rance, Lockerbie	1857 Wilson, Jas., Old Mill, New Cumnock
1873 Wilken, George, Waterside of Forbes, Alford	1858 Wilson, James, Banker, Kilmarnock
1860 Wilkie, Andrew, Banker, Leven	1860 Wilson, James, jun., Newton, Dalkeith
1843 Wilkie, D., of Auchlishie, Kirriemuir	1866 Wilson, Jas., 146 George Street, Edin- burgh
1857 Wilkie, George, Cowdenlaws, Dysart	1870 Wilson, Jas. R., Banker, Sanquhar
1830 Wilkie, John, of Foulden, Berwick	1874 Wilson, John, Cairnton, Boyndie, Banff
1862 Wilkin, T., Tinwald Downs, Dumfries	1841 Wilson, John, of Cumledge, Dunse
1873 Will, Robert W., S.S.C., 37 Albany Street, Edinburgh	1851 Wilson, J., Edington Mains, Chirnside
1872 Willacy, Robert, Penwortham Priory, Preston	1855 Wilson, John, Professor of Agriculture, University of Edinburgh
1867 Williams, W., Principal of the New Veterinary College, Edinburgh, Pro- fessor of Veterinary Surgery to the Society	1865 Wilson, John, Castle Park, Huntly
1858 Williamson, Andrew F., Standingstones, Dyce, Aberdeen	1857 Wilson, John, Overhouse, Strathaven
1870 Williamson, Benjamin, Canal Iron Works, Kendal	1859 Wilson, John, of Auchineck, Strath- blane
1861 Williamson, David Robertson, of Lawers, Crieff	1859 Wilson, J. F., Darnhall Mains, Eddlestone
1871 Williamson, Douglas G., Bombie, Kirk- cudbright	1862 Wilson, J., Chapelhill, Cockburnspath
1850 Williamson, George, Shempston, Elgin	1863 Wilson, J., of Hill Park, Bannockburn
1853 Williamson, Jas., Beechhill, Aberdeen	1863 Wilson, J. P., of Polquhaim, 19 Aber- cromby Place, Edinburgh
1829 Williamson, John W., Sheriff-clerk, Kinross	1867 Wilson, Matthew, Blackstoun House, Paisley
1871 Williamson, Thos., Merchant, Kirkcud- bright	1865 Wilson, Peter, Linsag, Kilfinan, Tigh- na-bruiach
1854 Willis, Thomas, Manor House, Carperby, Bedale	1870 Wilson, Peter, Noblehall, Leadburn
1868 Willison, Duncan Campbell, Dalpeddar, Sanquhar	1857 Wilson, Philip, Corn Factor, Dunse
1873 Willison, Geo., Ardlorach House, Luig, Oban	1858 Wilson, Richard, C.A., Edinburgh
1857 Willison, Jas. P., Maxwellton, Maybole	1852 Wilson, Robert, Durn, Perth
1858 Willison, John, Parish Holm, Douglas	1870 Wilson, Robert, Linseed Crusher, Dundee
1868 Willison, J., jun., Parish Holm, Douglas	1863 Wilson, Robert, Forehouse, Kilbarchan
1861 Wilson, Adam, Midshiels, Hawick	1868 Wilson, Robert, Lothenty, Alford, Aberdeenshire
1842 Wilson, Alex., Kilnhilloch, Cullen	1857 Wilson, Thomas, late Auchincorrie, Cambeltown
1854 Wilson, Alex., Kirkhill, Oldmeldrum	1849 Wilson, William, W.S., Edinburgh
1857 Wilson, Alex., Crosshill, Cambeltown	1873 Wilson, William, (Piksley, Sims, and Co), Leigh, Lancashire
1864 Wilson, Alex., Alford House, Dunblane	1858 Wilson, William, Rose Villa, Westham, East Bourne, Sussex
1864 Wilson, Alexander, of Skeoch, Ban- nockburn	1871 Wilson, William, Wolfstar, Tranent
1864 Wilson, Edward L., Manufacturer, Bannockburn	1871 Wilson, C. H. H., of Dalnair, Endrick Bank, Dryman
1859 Wilson, George, Harelaw, Chirnside	1873 Wilson, Thomas, Solicitor, Aberdeen
1863 Wilson, George, Heronhill, Hawick	1867 Wingate, William, Nether Croy, Kilsyth
1865 Wilson, G., Loch-House, Linlithgow	1855 Wishart, Edward, Merchant, Leith
1872 Wilson, George, Heriotsfield, Ancrum	1868 Wishart, W., Cairntraddlyn, Blackburn, Aberdeen
1859 Wilson, J., Woodhorn Manor, Morpeth —Free Life Member 1873	1860 Woddrop, William Allan, of Dalmar- nock, Dolphinton
1871 Wilson, James, Boghall, Houston	1874 Wood, Christopher, Kintrochat House, Brechin
1867 Wilson, James, Erskine, Glasgow	1873 Wood, Collingwood Lindsay, Howlish Hall, Bishop Auckland
1844 Wilson, James, Glasgow	1858 Wood, J., Midtown, King Edward, Banff
1874 Wilson, James, Blacksmith, Linlithgow	1864 Wood, J., Whiteside, Greenlaw, Dunse
1848 Wilson, Jas., Wester Cowden, Dalkeith	1835 Wood, John, Castle Terrace, Edin.
	1873 Wood, Walter A., 36 Worship Street, London, C.E.



Admitted

- 1828 Wood, William, 6 James Place, Leith  
 1841 Wood, William E. Collins, of Keithock,  
 Coupar-Angus  
 1858 Wotherspoon, Arch., Spotsmains, Kelso  
 1853 Wright, Andrew, Corstorphine  
 1857 Wright, Bryce, Dowhill, Girvan  
 1850 Wright, David, Beal, Northumberland  
 1839 Wright, James, Glasgow  
 1853 Wright, Jas., 19 Buckingham Terrace,  
 Edinburgh  
 1857 Wylie, George, of Arndean, Dollar  
 1870 Wylie, Alexr., Bolton, Haddington  
 1870 Wylie, And., Camstradden, Luss  
 1863 Wylie, James, Inveraray  
 1874 Wylie, James, Innerwick, Dunbar  
 1849 Wylie, John, late Newfarm, Mid-  
 Calder  
 1855 Wylie, W. A., 14 West End Park Street,  
 Glasgow  
 1874 Wylie, William, Fenwick, Ayrshire  
 1868 Yeats, Alexander, Advocate, Aberdeen  
 1838 Yeats, William, of Aquharney, Advo-  
 cate, Aberdeen  
 1864 Yool, Thomas, Coulard Bank, Elgin  
 1864 Yorstoun, Captain M. C., of Tinwald,  
 4 Lansdown Villas, Cheltenham  
 1852 Young, Alexander, Keir Mains, Dun-  
 blane  
 1867 Young, Andrew, Kilkenzie Castle,  
 Maybole  
 1859 Young, Andrew, Lochtyside, Thornton,  
 Kirkcaldy

Admitted

- 1854 Young, Hon. Lord, 28 Moray Place,  
 Edinburgh  
 1873 Young, George, Auctioneer, Dollar  
 1842 Young, Harry, of Cleish Castle, Kinross  
 1856 Young, James, Broadholm, Duntocher  
 1860 Young, J. A., Orchardtown, Garliestown  
 1863 Young, James, of Kelly, Limefield  
 House, West Calder  
 1871 Young, James, Waterton, Elgin  
 1875 Young, James, Cadboll, Fearn  
 1868 Young, John, jun. (J. & T. Young), Ayr  
 1857 Young, John, Fulwood, Paisley  
 1857 Young, John, Urieoch, Castle-Douglas  
 1863 Young, Matthew, Oilcake Mills, Ber-  
 wick-on-Tweed  
 1869 Young, Robert, Greenlees, Cambuslang  
 1870 Young, Major Thos., Lincluden House,  
 Dumfries  
 1872 Young, Thos., Oatridge, Linlithgow  
 1873 Young, William, Taylorton, Stirling  
 1873 Young, Wm., Waterbank, Cammunock  
 1870 Younger, Henry J., Abbey Brewery,  
 Edinburgh  
 1875 Younger J.B.B.C., Pitlessie, Ladybank  
 1863 Younger, Robert, St Anns, Edinburgh  
 1863 Younger, William, Haggerston Castle,  
 Beal  
 1870 Yuill, Arch., 33 Cathedral St., Glasgow  
 1838 Yuille, And. B., of Darleith, Cardross  
 1869 Yule, Edward, Prestongrange, Preston-  
 pans  
 1852 Yule, Thomas B., Merchant, Leith  
 1868 Yule, John S., Little Ardo, Methlic

Total Number of Members, 4430.

HONORARY MEMBERS.

HONORARY ASSOCIATES.

Admitted

- 1836 Blandon, M. Von, St Petersburg  
 1874 Dahl, Ferdinand August, Aas, Chris-  
 tiania

Admitted

- 1874 Holst, Christain, Norwegian Court  
 Paymaster

DIPLOMA FREE LIFE MEMBERS.

- 1873 Ashdown, A. H., M.R.A.C., Upping-  
 ton, Salop  
 1873 Brown, Wm., Factor, Earlsmill, Forres  
 1873 Browne, Colville, M.R.A.C., Long  
 Melford, Suffolk  
 1874 Burn, Forbes, Hardacres, Coldstream  
 1873 Brydon, Robert, The Dene, Seaham  
 Harbour  
 1873 Campbell, George, Shanes Castle,  
 Antrim

60 *List of Members of the Highland and Agricultural Society, 1875.*

Admitted

1873 Eley, Wm. Henry, Islingham, Frindsbury, Rochester, Kent

1873 Elliot, Thomas John, M.R.A.C., Langley Park, Norwich

1874 Erskine, Henry, Dalladies, Brechin

1873 Gerrard, John, Veterinary Infirmary, Market Deeping

1873 Giglioli, Italo, M.R.A.C., Florence

1873 Goddard, H. R., M.R.A.C., Belsay, Newcastle-on-Tyne

1874 Henderson, Richard, Coldstream

1873 Hill, Arthur James, M.R.A.C., Accountant, Moorgate Street, London

1873 Jukes, R. F., M.R.A.C., Cotwall, Wellington, Salop

1873 Milne, John, Mains of Laithers, Turriff

Admitted

1873 Munby, Edward Charles, M.R.A.C., Myton Grange, Helperby, Yorkshire

1873 Norman, Wm., M.R.A.C., Hall Bank, Aspatria

1873 Rome, Thomas, M.R.A.C., Northampton Downs, Barcoo River, Queensland

1873 Smith, William B., M.R.A.C., Stoneleigh Villa, Leamington

1873 Torry, Adam Ogilvie, St Anne's, Coupar-Angus

1873 Wall, G. Y., M.R.A.C., Durham

1873 Walton, George Kent, Long Compton, Shipston-on-Stour, Warwickshire

1873 Wilson, Jacob, M.R.A.C., Woodhorn Manor, Morpeth

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